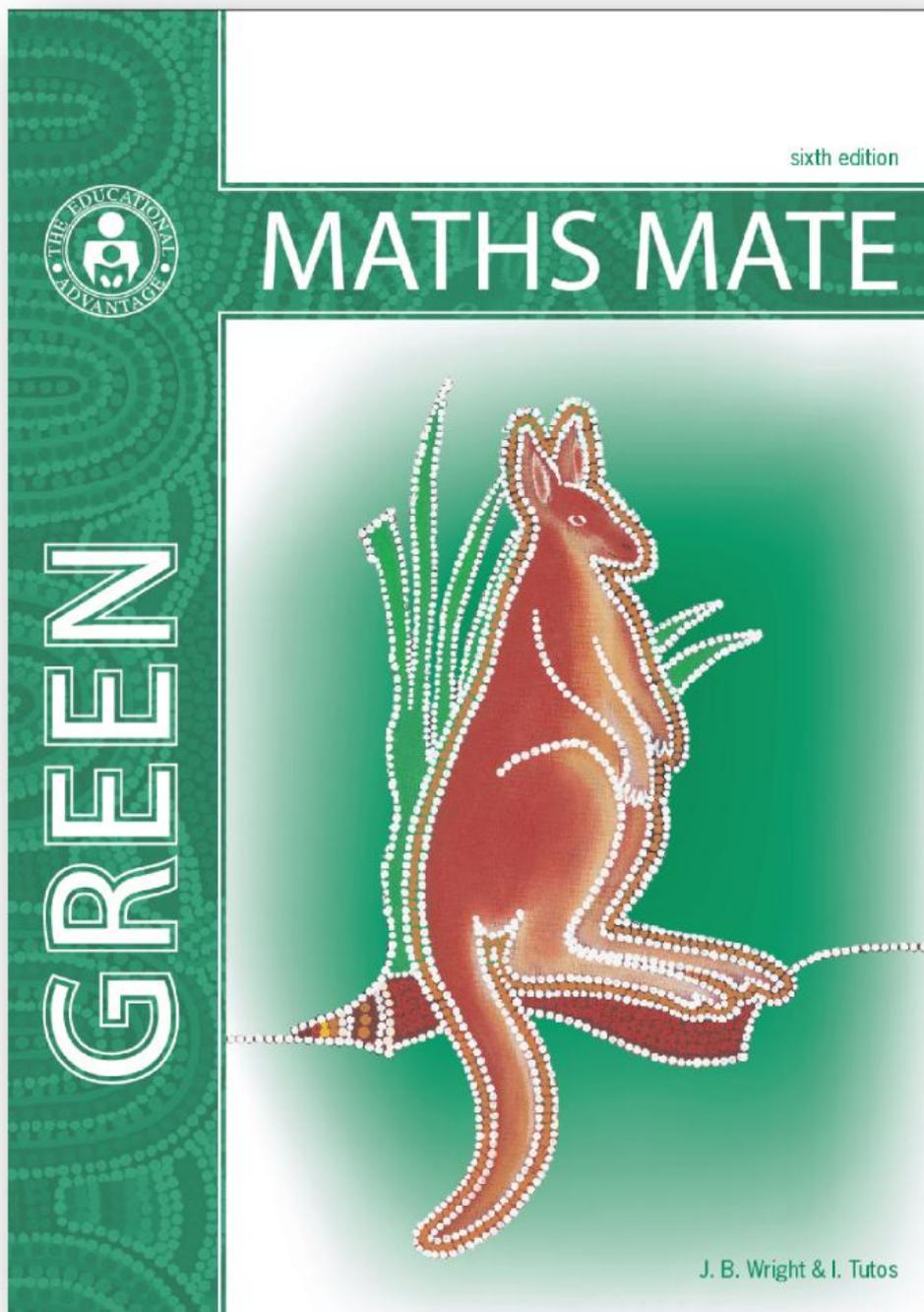


MATHS MATE

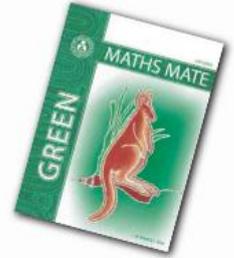


sixth edition



MATHS MATE

Teacher Resource Green (Maths Mate year 8)



- ▶ Teacher's Guide to the Use of Maths Mate
- ▶ Student Workbook Answers
- ▶ Student Workbook Short Answers
- ▶ Problem Solving Hints & Solutions
- ▶ Test Masters
- ▶ Test Answers
- ▶ Record Keeping Sheets

For your free Skill Builder Blue/Green contact us:

- ▶ info@mathsmate.net

J. B. Wright & I. Tutos

GREEN

MATHS MATE



Teacher Resource



Teacher's Guide to the Use of Maths Mate

pages i - viii



Student Workbook Answers

pages 3 - 72



Student Workbook Short Answers

pages 1 - 8



Problem Solving Hints & Solutions

pages 1 - 20



Test Masters

pages 1 - 32



Test Answers

pages 1 - 32



Record Keeping Sheets

pages 1 - 10

This Teacher Resource PDF
comes with a limited
Lifetime Update Guarantee.

Each time a new edition of the
Maths Mate Program is released,
an **upgrade** for your
Teacher Resource PDF is available
FREE* of charge
when you contact us direct.

This ensures that each teacher can have the latest edition without your school having to incur any further costs. We have chosen to do this to demonstrate the strength of our belief that access to a Teacher Resource PDF is important in the smooth running and success of the programme.

* The free Teacher Resource PDF is limited to schools that continue to purchase at least 25 student workbooks.





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J. B. Wright & I. Tutos

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Preface

The Maths Mate Review Program is designed to be used in schools by students from years 3 to 10 (Australia) and years 4 to 11 (New Zealand). Emphasis is placed on the review and gradual development of basic skills.

It is not expected that all students will be able to complete every question from week one. Some questions have been designed to offer a real challenge. However, a major strength of the program is that students are consistently confronted with problems relating to their understanding of the same basic skill, encouraging them to see the need to master that skill in order to progress.

RECOMMENDED GRADE / YEAR LEVEL INDICATOR

	AUS 1	2	3	4	5	6	7	8	9	10	11	12
Orange Student Workbook - 2nd Ed.												
Rose Student Workbook - 2nd Ed.												
Yellow Student Workbook - 5th Ed.												
Red Student Workbook - 5th Ed.												
Blue Student Workbook - 6th Ed.												
Green Student Workbook - 6th Ed.												
Mauve Student Workbook - 6th Ed.												
Coffee Student Workbook - 3rd Ed.												
Lime Student Workbook - 6th Ed.												
Silver Student Workbook - 3rd Ed.												

NZ Y2 Y3 Y4 Y5 Y6 Y7 Y8 Y9 Y10 Y11 Y12 Y13

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Maths Mate Green cover painting

Kangaroo - 2003
 Acrylic on canvas 60 x 50 cm
 by Australian artist Susan Betts - Kokata, Mirning and Wirangu.

'Kangaroo' was purchased by The Educational Advantage who have been kindly given permission to reproduce the painting. This contemporary Aboriginal artwork combines traditional and modern techniques. Susan's rich and vibrant art reflects the Australian landscape and wildlife, both flora and fauna.

PREFACE

The Author

Joseph Wright has taught in a number of schools throughout Australia and also in the United States of America. His experiences led him to the firm belief that there was a real need for a Mathematics program which was based on a constant review of the basic skills which students acquire. The Maths Mate Program was designed to meet that need.

Acknowledgements

"The completion of this project was made possible by the hard work and inspiration of Joanna Tutos, Lou McKenna and Julie Moyle. Thanks to John and Wilma McCormack and the many colleagues and friends who contribute to the overall program. Special thanks to my wife Trish and our children, Peter, David, Rebecca, Paul and Anthony for their investment of time, energy, encouragement and faith."



Preface

The Maths Mate Program has been designed to be used in schools by students from Years 3 to 10 (Australia) and Years 4 to 11 (New Zealand). Emphasis is placed on the review and gradual development of basic skills so that students keep their skills up to date and teachers need to spend less class time on revision when starting new or subsequent topics.

The program is designed to have students complete eight worksheets each term. It is not expected that all students will be able to complete every question from week one. Some questions have been designed to offer a real challenge. However, a major strength of the program is that students are consistently confronted with problems dealing with their understanding of the same basic skills, encouraging them to see the need to master those skills in order to progress.

Maths Mate is a very comprehensive program which is not only structured to help students see a logical progression in their work but also to make life easier for teachers. Easy to use record keeping sheets have been provided on the Teacher Resource PDF. The tests, which are given twice a term, provide a very good indication of individual student strengths and weaknesses and this information can also be very valuable for addressing specific problems as well as assessing progress.

Aims of the Maths Mate Program

- Provide students with regular work that helps maintain and develop skills acquired throughout the year.
- Present a structured approach so that students can see their development in specific skill areas.
- Encourage students to take responsibility for their own learning.
- Provide a challenging level of work for all students.
- Encourage parental involvement in the learning process.
- Assist teachers in the diagnosis of student strengths and weaknesses.
- Provide teachers with a concrete method of assessing students' effort and progress on a regular basis.
- Provide a consistent review program which ensures students are regularly being exposed to the Mathematical skills appropriate to their ability level.

A Teacher's Guide to the successful Implementation of the
MATHS MATE PROGRAM

The Maths Mate Program offers many valuable benefits, including the aspects of parental involvement, systemised revision, individual and group diagnostics, enhanced professional standing for teachers, and most importantly, improved efficiency in student learning. However, a number of these factors may be negated or even lost if an individual teacher or school does not effectively implement the program. The Maths Mate Program was designed with an awareness of the increasing time demands placed on classroom teachers by ever-changing curriculum development and more involved assessment and reporting procedures. Maths Mate is a dynamic tool for classroom teachers designed to effectively improve student outcomes in Mathematics, to report accurately on these and to do so within a manageable time frame.

This guide was written to assist with the implementation of Maths Mate. This first page sets out the planning and preparation required by the Head of Mathematics and/or Maths Mate Coordinator, where one is appointed, before beginning the program. The following pages are a guide for classroom teachers using the program.

SUGGESTIONS FOR PREPARATION AND ORGANISATION:

Make sure parents are given advanced notice of the implementation of the Program. This might include an introduction at Parent Information meetings at the end of the year in preparation for the next.

At the start of the new school year a letter should be sent home to parents (see PDF ~ Teacher's Guide to the use of Maths Mate, or the editable word.doc, or www.mathsmate.co.nz ~ Downloads). Parental involvement should be encouraged. Their checking to see that work is completed weekly, and their signing of each sheet, should be stressed as important to the program's success. (A follow up reminder later in the year should also be considered.)

If you are fortunate enough to have audio visual screens in your classrooms, you might consider showing the answers from the Student Workbook Answers PDF files.

Thoroughly brief teachers on the use and advantages to them of the Maths Mate Program. Greater commitment will be given by all teachers if they are aware of the goals underlying the program and have a thorough understanding of the most efficient ways of implementation.

Give a demonstration of marking and recording procedures, and the potential use of Skill Builders, as an inservice exercise prior to the start of the school year. The pages that follow may be of assistance here.

Important: If the school has purchased the student workbooks for the students, you may be able to organise the separation of the workbooks (see page iv) prior to the start of the year, perhaps even at the end of the current year.

Reminder: The Teacher Resource PDF will be replaced free of charge when a class set of a revised edition is purchased.



It is often possible for The Educational Advantage to send a representative of the Maths Mate Program to visit your school. Should you consider this assistance advantageous, please contact us to arrange a visit.

Phone: 03 9899 9065 (Australia)

Email: info@mathsmate.net

Phone: 07 929 4063 (New Zealand)

Email: info@mathsmate.co.nz

A Teacher's Guide to the Use of the MATHS MATE PROGRAM

The effective use of Maths Mate requires some good house-keeping on the part of teachers involved.

STARTING THE YEAR:

Each student will receive a Maths Mate Student Workbook appropriate to his or her level. This workbook will contain 32 worksheets of increasing difficulty. (Having 8 worksheets per term allows some flexibility to schools.)

Collect the workbooks from the students on the first day of the year. Use a class list to be sure that any student who has not yet obtained a copy is identified.

Organise for the pages of the student workbooks to be separated so that class sets of each worksheet can be placed in manila folders or plastic pockets for distribution to students on a weekly basis. (The help of teacher assistants, students or a parent support group may be useful here.) This avoids problems with a student losing a workbook and having trouble completing Maths Mate work for the remainder of the year. The covers can be used as a colourful divider to mark a section for Maths Mate work should the students be using a binder.

At the start of the year, brief your class on the advantages of the program. 'Sell' them the gains they can make with its effective use. Emphasise that, because of the nature of human memory, this program with its systematic, cyclic revision allows for maximum 'absorption' of learned procedures and for the strong reinforcement of important skills. These skills are a necessary prerequisite to problem-solving. Also explain that this is one of their responsibilities in the 'Teaching-Learning Process' and that as they progress further through the educational system, they will need to accept greater personal responsibility for their own learning.

Ensure that you take the time to fully explain the use of the program, how it will be marked, the recording process of results and the diagnostic benefits of those results for identification of appropriate *Skill Builders*.

See that each child receives a letter to parents informing them of the Maths Mate Program. Stress the parental involvement and the need for signatures on each sheet and see that you collect all the return slips for your class.

When submitting work, students might be asked to attach a separate sheet showing appropriate steps in their working. If the question can be answered in a single step, there is little to be gained from asking students to copy the question. If an intermediate step is required to obtain the answer, the student should set the question out appropriately. Such questions are marked with an asterisk ' * ' to indicate to students that working is expected to be shown.

Emphasise that all problems on the worksheets and test sheets are designed to be attempted without the aid of a calculator. Students are unlikely to become confident Mathematicians if they do not have a reasonable background of basic skills.

It is important to explain your expectations to the class. Naturally these will be relative to their level of mathematical ability. Some class members may be expected to attempt all questions including the problems at the end whereas others may only be expected to complete the sheets in part (but encouraged to go further when possible).

Also explain that the material covered in each worksheet may not necessarily reflect the work being undertaken in class at the time. The work covered by the Maths Mate Program should, with minor exceptions, be revision of work introduced in previous years of study. The exceptions will depend to some degree on the background of your students.

STARTING EACH TERM:

At the start of every term give each student a new *Worksheet Results* sheet located at the beginning of each term in the Student Workbook. Explain the importance of the upkeep of this document and how it may be used to identify which skills they have acquired and which skills they still need to learn and practise. Introduce the availability of *Skill Builders*. Providing a new sheet each term gives you a chance to further encourage students to make a fresh start and to set new goals for the term.

A hard copy of this profile sheet is best kept by the class teacher and handed back to the students every week for them to update during the correction process. Extra copies can be made for those students who would like to have a copy of their own to show their parents (see PDF ~ Record Keeping Sheets, pages 1 to 4, or www.mathsmate.co.nz ~ Downloads).

WEEK - TO - WEEK:

Get the students into a routine early. Assign the Maths Mate worksheet at the same time each week and have it returned on the same day the following week.

On the date worksheets are due, the teacher and students correct answers together in class. When marking, have students correct their own work by reading the answers to them or use an overhead screen. Having students correct their own work is less about saving the teacher's time for more important work, but more about building the process of developing in students responsibility for their own learning. It also means that students end up with a much clearer idea of the areas in which they need to concentrate their efforts.

When giving the answers, avoid pausing to discuss the answers at this stage. By using the numbered squares at the base of the worksheets to record correct responses, the time taken to transfer results to the *Worksheet Results* sheet can be minimised (see Fig. 1). The squares at the base of each worksheet can be rotated and aligned with those on the *Worksheet Results* sheet to enable a quick transfer of the correct responses.

Should there be need for explanation of one or more answers or perhaps how a problem was solved, you can decide on the relative worth to the class and commit appropriate time on that basis. After the correction has been completed, it can be valuable to spend time on a problem that has clearly attracted the class's attention while they are focused on it and their interest is high. On the other hand, care needs to be taken to ensure extended periods of time are not spent catering to individual needs with the bulk of the class waiting.

Remember to check the *Problem Solving Hints & Solutions* (see PDF ~ Problem Solving Hints & Solutions, pages 1 to 20). They supply teachers with ready answers to the more challenging problem solving questions found at the end of each Maths Mate worksheet. They also contain helpful hints for developing students' problem solving skills.

Have the students fill in their *Worksheet Results* sheets and select a relevant *Skill Builder* sheet if appropriate. *Skill Builder* links are listed beside each set of four worksheets (see Fig. 1). Students should work through the *Skill Builders* in order. Where possible the skills are arranged in increasing degree of difficulty. Be aware that some skills may require the knowledge of previous skills. Generally when a student has several areas of weakness, he or she should work on the lowest numbered question first. For example, students struggling with Q5 and Q7 will need to build skills required for Q5 before they can improve Q7.

MATHS MATE		Name: Emily Moyle				
		Class: 8/9B				
		Teacher: Miss Bourke				
Worksheet Results		Skill Builder links				
Term 1		Sheet 1	Sheet 2	Sheet 3	Sheet 4	
NUMBERS & ALGEBRA	1. [+ Whole Numbers to 10]	1	1	1	1	1.1
	2. [- Whole Numbers to 10]	2	2	2	2	2.1
	3. [x Whole Numbers to 12]	3	3	3	3	3.1
	4. [+ Whole Numbers to 12]	4	4	4	4	4.1
	5. [Large Number +,-]	5	5	5	5	5.3
	6. [Large Number x,-]	6	6	6	6	6.1,5
	7. [Decimal +,-]	7	7	7	7	7.2
	8. [Decimal x,-]	8	8	8	8	8.1
	9. [Fraction +,-]	9	9	9	9	9.3,4
	10. [Fraction x,-]	10	10	10	10	10.2
	11. [Percentages]	11	11	11	11	11.3
	12. [Decimals / Fractions / Percentages]	12	12	12	12	12.2
	13. [Integers]	13	13	13	13	13.3,4
	14. [Rates / Ratios]	14	14	14	14	14.3
	15. [Indices / Square Roots]	15	15	15	15	15.3
	16. [Order of Operations]	16	16	16	16	16.4
	17. [Exploring Numbers]	17	17	17	17	17.2
	18. [Multiples / Factors / Primes]	18	18	18	18	18.4
	19. [Number Patterns]	19	19	19	19	19.1,2,3
MEASUREMENT & GEOMETRY	20. [Expressions]	20	20	20	20	20.2
	21. [Substitution]	21	21	21	21	21.4
	22. [Equations]	22	22	22	22	22.2
	23. [Coordinates]	23	23	23	23	23.4
	24. [Units of Measurement / Time]	24	24	24	24	24.3
MATHS MATE PROBLEM SOLVING	25. [Perimeter]	25	25	25	25	25.3
	26. [Area / Volume]	26	26	26	26	26.4
	27. [Shapes]	27	27	27	27	27.3,4
	28. [Location / Transformation]	28	28	28	28	28.3
	29. [Statistics]	29	29	29	29	29.4
	30. [Probability]	30	30	30	30	30.4
	31. [Problem Solving 1]	31	31	31	31	Hints & Solutions
	32. [Problem Solving 2]	32	32	32	32	Hints & Solutions
	33. [Problem Solving 3]	33	33	33	33	Hints & Solutions
	Total Correct		27	24	22	26

Fig. 1 - Sample *Worksheet Results* sheet

8. [Decimal \times, \div]

Skill 8.1 multiply a decimal number by a single digit number

Blue 1 2 3 4 4
Green 1 1 2 3 3 4 4

- Multiply from right to left, disregarding the decimal point.
- Count the number of places to the right of the decimal point in the question.
- Position the decimal point the same number of places from the right in the answer.

Q. $0.62 \times 4 =$ A. $0.62 \times 4 = 2.48$ $4 \times 2 = 8$ write 8
 $4 \times 6 = 24$ carry 2, write 4
 $4 \times 0 + \text{carry } 2 = 2$ write 2

2.48 2.48 2.48

2 decimal places in question so move decimal point 2 places from right in the answer

a) $0.9 \times 3 =$ b) $0.8 \times 2 =$ c) $0.7 \times 5 =$

d) $0.4 \times 6 =$ e) $0.3 \times 7 =$ f) $0.6 \times 9 =$

g) $5.1 \times 3 =$ h) $4.3 \times 6 =$ i) $2.7 \times 4 =$

j) $3.8 \times 2 =$ k) $1.9 \times 5 =$ l) $7.3 \times 8 =$

Fig. 2 - Sample Skill Builder sheet

Understand that any question on the Maths Mate worksheets is part of a set of four similar questions in the term. For example, consider sheets 1, 2, 3 and 4 in MM Green (year 8) term 1. Question 12 on each sheet is similar in design, content and degree of difficulty. This grouping of question style is also true for the next set of four worksheets and so on. Thus the Maths Mate tests (see PDF ~ Test Masters, pages 1 to 32) also reflect this grouping of question style and substance. Generally too, the Skill Builders can be linked to each set of four similar questions. These links are identified, not only on the Worksheet Results sheet but also on the grid at the title of each Skill Builder (see Fig. 2). Both references should be helpful for the allocation of Skill Builders to students.

Collect the students' Maths Mate worksheets and attached working, the Worksheet Results sheets and any completed Skill Builders.

Enter Maths Mate results onto your Worksheet Record, see Fig. 3 (see also PDF ~ Record Keeping Sheets, pages 7 to 10, or www.mathsmate.co.nz ~ Downloads). Firstly, a record of the total number of correct answers for each week can be written. The presence of a parent's signature may also be noted to monitor whether work was attempted by the student at home. Late work can also be noted. This system is explained at the base of the Worksheet Record sheet. Finally, a record of any Skill Builder completed or reward given to the student for good or improving work might be noted.

It is important that students are encouraged to complete every Maths Mate worksheet to maintain the effectiveness of the program.

Skill Builders are available to students, teachers and parents from the Maths Mate websites www.mathsmate.net and www.mathsmate.co.nz The Skill Builders extensively target through instruction and practice, all skills within the related Maths Mate Program except the problem solving questions. The Skill Builders also contain a Glossary of important facts and reference material that will provide instant help when students experience difficulties. Parents could be reminded of their access to this facility.

MATHS MATE		Worksheet Record							
		Term 1							
Class: 8/9B		Teacher: Miss Bourke							
Worksheet Number		1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8
1	ASHTON Darcy	15 ✓							
2	BAKER Stobhan	28 × L 1							
3	BOURKE Louise	26 ✓ 6							
4	CROSS Chris	14 ✓ 4							
5	DWYER Jim	31 × 15							
6	FIORE Ella	22 ✓							
7	FREEMAN Warren	17 ✓ 19							
8	HAHN Kim	21 ✓							
9	HU Joanna	26 ✓							
10	JILBERT Luke	19 × L 12							
11	KEUNEMAN John	22 ✓ 11							
12	McKENNA Joseph	18 ✓ 13							
13	MOYLE Brendan	24 ✓ 13							
14	MOYLE Emily	27 ✓ 8							
15	NESBIT Peter	32 ✓ 17							
16	RYAN Jacinta	21 × L 4							
17	RYAN Madeline	19 ✓ 14							
18	SETON Elizabeth	24 ×							
19	TUTOS Alexander	22 ✓ 12							
20	WINKELS Tim	19 × 5							
21	WRIGHT Anthony	28 ✓ 9							
22	WRIGHT Paul	20 ✓ 8							
23	YEO Tania	27 ✓							
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									

✓ - Signed by parent L - Work handed in late × - Not signed by parent

Fig. 3 - Sample Worksheet Record sheet

AFTER EVERY FOUR WORKSHEETS:

Tests are given twice a term. These tests take the same format as the worksheets and are based on the previous four worksheets. A and B tests are provided to allow alternate students to have a different test, thereby ensuring scores accurately reflect the student's own work. (The two tests can be distinguished by their label at the base of the second page, e.g. Green~Test 3A and Green~Test 3B.) The tests serve a number of purposes. They give the teacher a more accurate indication of the student's abilities in conditions where the child does not have the assistance of a parent or tutor. They also help to motivate students to correct their work accurately and increase their desire to learn the required skills. Without the tests, students may become comfortable with seeking assistance to achieve high scores, unaware of the importance of fully understanding their work.

It is at this point that teachers record accurately how students are performing in each area of skill. A *Test Results* sheet is provided (see PDF ~ Record Keeping Sheets, page 5, or www.mathsmate.co.nz ~ Downloads). It is expected that one of these forms be completed for each student in the class when recording test results. Again, the numbering system at the bottom of each page helps speed up this process. When administering the tests, it is advisable to have an assignment of some form or a *Skill Builder* worksheet available for students to begin as soon as they complete the test, which may only take 30 minutes for an able student.

TOPIC - TO - TOPIC:

A periodic check of the *Test Results* sheets will assist you in evaluating individual or possible class areas of concern. You can then plan appropriate *Skill Builder* work or advise individual students of concerns (perhaps as a guide to tutoring). It will also give you a valuable indication of the background skills students have before beginning a new topic, allowing you to tailor your lessons appropriately. In fact you are saved from having to pre-test students before each topic. This will result in a considerable saving of class time.

END OF SEMESTER:

Combined, the *Worksheet Results* sheet, the *Test Results* sheet and the *Worksheet Record* sheet become invaluable for writing reports and for preparing for parent / teacher interviews. They give a good indication to parents, not only of the child's skills but also of the consistency of their effort and the degree of responsibility they have assumed for their learning. At the end of the year, particularly when moving into a level where streaming occurs or into senior Mathematics classes, these records allow clear comparisons of students to be made across class groups.

MERIT CERTIFICATES:

Merit Certificates can be used to encourage and reward selected students for consistent work, outstanding results or best of all, for significant improvement. A master Merit Certificate can be found on the Teacher Resource PDF and can be printed and presented to students at the teacher's discretion.



We are confident you will find the Maths Mate Program a valuable asset to your teaching. We thank all those teachers who have provided feedback on this program and we value further comments and suggestions. Please direct all correspondence to:

Joe Wright
The Educational Advantage Pty Ltd
Building 5 / 29 Clarice Road
Box Hill South VIC 3128
AUSTRALIA
Phone: 613 9899 9065
Email: info@mathsmate.net
Website: www.mathsmate.net

Learning Works
408 Anglesea Street
Hamilton 3240
NEW ZEALAND
Phone: 647 929 4063
Email: info@mathsmate.co.nz
Website: www.mathsmate.co.nz

Dear Parents,

This year, as part of their Mathematics program, all Year 8/9 students will be given a Maths Mate worksheet on a regular basis. There will be 8 worksheets to be completed each term, generally one per week, the exceptions being short or disrupted weeks.

The Maths Mate worksheets have been designed to allow students to attempt all questions without the aid of a calculator, and this should be encouraged at home.

Don't be too concerned if your child finds the initial worksheet difficult. It is not expected that students will be able to complete every question from week one; in fact Q33 has been included to offer a real challenge to all students. Each worksheet is built around a common framework of questions aimed at covering the current Mathematics Curriculum.

While there is room on the worksheet for the recording of answers, this is only intended as a summary of the student's work. An asterisk ' * ' has been used to indicate those questions where each student has been asked to show his or her working. In these cases the detail normally expected in Mathematics should be included, with all steps in the development of answers clearly shown. This working should be attached to the worksheet and submitted with it.

Corresponding questions on each worksheet cover the same skill area; that is, Q1 always tests adding whole numbers to 10, Q2, subtracting whole numbers to 10, and so on with the questions within each category becoming progressively more difficult from week to week.

Students will be confronted by the same type of question on a regular basis. The diagnostic nature of the worksheets will help students and teachers to identify areas of strength and weakness. This should also help to motivate students to make another attempt at mastering skills that they may have found too difficult in the past. As well, the results sheet, if completed accurately, will allow students to enjoy monitoring their own improvement.

If your child is having difficulty with a certain skill, Skill Builders are available to students, teachers and parents from the Maths Mate websites www.mathsmate.net and www.mathsmate.co.nz The Skill Builders also contain a Glossary of important facts and reference material that will provide students with instant help.

It would be appreciated if you would complete the tear off slip at the bottom of this page so that we can be sure that you are aware of our expectations. We ask also that you sign the completed worksheet each week to acknowledge that your child is working independently and regularly but with your support.

We thank you in anticipation of your involvement and remind you that you are encouraged to call and discuss your child's progress at any time.

Yours sincerely,

Class Teacher

Principal

Maths Mate Program - Return Slip

Student's Name: Class:

As a parent / guardian I have signed this form to indicate that I am aware of the Maths Mate requirements expected of my child.

Parent's Signature: Date:

Dear Parents,

This year, as part of their Mathematics program, all Year 5/6 students will be given a Maths Mate worksheet on a regular basis. There will be 8 worksheets to be completed each term, generally one per week, the exceptions being short or disrupted weeks.

The Maths Mate worksheets have been designed to allow students to attempt all questions without the aid of a calculator, and this should be encouraged at home.

Don't be too concerned if your child finds the initial worksheet difficult. It is not expected that students will be able to complete every question from week one; in fact Q24 has been included to offer a real challenge to all students. Each worksheet is built around a common framework of questions aimed at covering the current Mathematics Curriculum.

While there is room on the worksheet for the recording of answers, this is only intended as a summary of the student's work. An asterisk ' * ' has been used to indicate those questions where each student has been asked to show his or her working. In these cases the detail normally expected in Mathematics should be included, with all steps in the development of answers clearly shown. This working should be attached to the worksheet and submitted with it.

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We thank you in anticipation of your involvement and remind you that you are encouraged to call and discuss your child's progress at any time.

Yours sincerely,

Class Teacher

Principal



Maths Mate Program - Return Slip

Student's Name: Class:

As a parent / guardian I have signed this form to indicate that I am aware of the Maths Mate requirements expected of my child.

Parent's Signature: Date:

MATHS MATE



Teacher Resource



Teacher's Guide to the Use of Maths Mate

pages i - viii



Student Workbook Answers

pages 3 - 72



Student Workbook Short Answers

pages 1 - 8



Problem Solving Hints & Solutions

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Test Masters

pages 1 - 32



Test Answers

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Record Keeping Sheets

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Name:

Due Date: / /

Parent's Signature:

QUOTE OF THE WEEK

Advice is seldom welcome, and those who want it the most always like it the least.
Earl of Chesterfield

1. [+ Whole Numbers to 10]

	4	6	11	8	7	13	10	2	9	15
+ 3	7	9	14	11	10	16	13	5	12	18

2. [- Whole Numbers to 10]

	15	17	8	6	13	9	11	12	10	14
- 4	11	13	4	2	9	5	7	8	6	10

3. [× Whole Numbers to 12]

	4	5	10	8	7	11	3	6	9	12
× 2	8	10	20	16	14	22	6	12	18	24

4. [÷ Whole Numbers to 12]

	5	10	40	45	30	35	20	15	50	25
÷ 5	1	2	8	9	6	7	4	3	10	5

5. [Large Number +,-] *

$$2453 - 249 = \boxed{2204}$$

6. [Large Number ×,÷] *

$$3070 \div 10 = \boxed{307}$$

7. [Decimal +,-] *

$$3.57 + 4.81 = \boxed{8.38}$$

8. [Decimal ×,÷] *

$$0.35 \times 10 = \boxed{3.5}$$

9. [Fraction +,-]

$$\frac{5}{7} + \frac{1}{7} = \boxed{\frac{6}{7}}$$

10. [Fraction ×,÷] *

$$5 \times \frac{3}{7} = \boxed{2\frac{1}{7}}$$

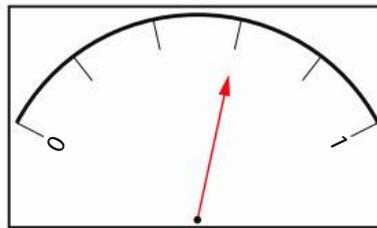
11. [Percentages] *

15% of the Australian population is aged 65+. What percentage of the population are under 65?

$$\boxed{85\%}$$

12. [Decimals / Fractions / Percents]

What decimal number is shown on this meter?



$$\boxed{0.6}$$

13. [Integers]

Arrange in ascending order:

5, -2, 3, -6, 7

$$\boxed{-6, -2, 3, 5, 7}$$

14. [Rates / Ratios]

Simplify the ratio

$$18 : 30 = \boxed{3 : 5}$$

15. [Indices / Square Roots]

$$6^2 = \boxed{36}$$

16. [Order of Operations] *

$$3 + 7 \times 3 = \boxed{24}$$

17. [Exploring Numbers]

What is the value of the underlined digit in the number 964?

$$\boxed{60}$$

18. [Multiples / Factors / Primes] *

List the common multiples of 4 and 5 up to 60.

$$\boxed{20, 40, 60}$$

19. [Number Patterns]

Complete the pattern:

$$2, 10, 18, 26, \boxed{34, 42}$$

20. [Expressions]

$$\text{Simplify } t + t + t = \boxed{3t}$$

21. [Substitution] *

If $y = 8$, find the value of $3y + 7$ $\boxed{31}$

22. [Equations]

$$\boxed{6} + 7 = 13$$

23. [Coordinates]

What is the grid reference of the enemy hit on the battleship?

Enemy hit

Battleship

B4

24. [Units of Measurement / Time] *

16 m = **16 000** mm

25. [Perimeter] *

Use a ruler to find the perimeter of the parallelogram in millimetres.

150 mm

26. [Area / Volume]

Do these triangles have the same area?

yes

27. [Shapes]

Use a protractor to measure this angle.

85°

28. [Location / Transformation]

Draw all the axes of symmetry of this shape. How many axes of symmetry does this shape have?

4

29. [Statistics]

Which world region has the highest penetration of the internet?

World Internet Usage 2019		
World Regions	% popn. penetration	% of world popn.
Africa	37.3	17.1
Asia	51.8	55.0
Europe	86.8	10.7
Latin America/Caribbean	67.5	8.5
Middle East	67.2	3.3
North America	89.4	4.7
Oceania/Australia	68.4	0.5
WORLD TOTAL	56.8	100

North America

30. [Probability]

Ita can choose an economy, business or first class flight to London, Paris or Rome. How many different outcomes are possible? [Complete the table.]

Outcomes (sample space)	
flight type	destination
economy	London
economy	Paris
economy	Rome
business	London
business	Paris
business	Rome
first	London
first	Paris
first	Rome

9

31. [Problem Solving 1] *

Some cubes have been removed from an array of $5 \times 3 \times 3$. How many cubes remain?

25

32. [Problem Solving 2]

A man looking at a photograph says, "Brothers and sisters I have none, but that man's father is my father's son." Who is in the photograph?

his own son

33. [Problem Solving 3] *

Three girls, Angela, Lakisha and Jessica, each have one brother and one pet. Lakisha has a bulldog. The horse belongs to the girl whose brother is Paul. If Angela's brother is Ken and the other brother is Stephen, who is Jessica's brother?

Paul



Name:

Due Date: / /

Parent's Signature:

QUOTE OF THE WEEK

Jones' Law - The man who can smile when things go wrong has thought of someone he can blame it on.
Rossiter

1. [+ Whole Numbers to 10]

	5	6	10	2	8	11	7	4	9	3
+ 1	6	7	11	3	9	12	8	5	10	4

2. [- Whole Numbers to 10]

	19	7	6	10	12	8	4	11	13	5
- 2	17	5	4	8	10	6	2	9	11	3

3. [× Whole Numbers to 12]

	4	7	5	2	1	6	9	3	10	8
× 3	12	21	15	6	3	18	27	9	30	24

4. [+ Whole Numbers to 12]

	24	4	16	32	12	28	36	20	40	8
÷ 4	6	1	4	8	3	7	9	5	10	2

5. [Large Number +,-] *

$$7563 - 3482 = \boxed{4081}$$

6. [Large Number ×,÷] *

$$22000 \div 100 = \boxed{220}$$

7. [Decimal +,-] *

$$25.9 + 30.7 = \boxed{56.6}$$

8. [Decimal ×,÷] *

$$0.622 \times 100 = \boxed{62.2}$$

9. [Fraction +,-] *

$$\frac{11}{13} - \frac{4}{13} = \boxed{\frac{7}{13}}$$

10. [Fraction ×,÷] *

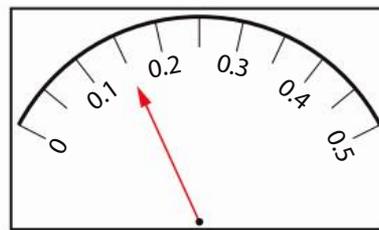
$$\frac{3}{7} \times 14 = \boxed{6}$$

11. [Percentages] *

What percentage of the distance covered by an Olympic triathlon do athletes cycle if they swim for 3%, run for 20% and cycle the remainder? $\boxed{77\%}$

12. [Decimals / Fractions / Percents]

What decimal number is shown on this meter?



$\boxed{0.15}$

17. [Exploring Numbers]

In the number 3.241 which digit is in the hundredths place?

$\boxed{4}$

18. [Multiples / Factors / Primes] *

List the common multiples of 3 and 7 up to 70.

$\boxed{21, 42, 63}$

19. [Number Patterns]

Complete the pattern:

43, 37, 31, 25, $\boxed{19, 13}$

13. [Integers]

Use < or > to make a true statement.

3 $\boxed{>}$ -4

14. [Rates / Ratios]

Simplify the ratio

40 : 28 $\boxed{10:7}$

20. [Expressions]

Simplify $m + m - m + m$ $\boxed{2m}$

15. [Indices / Square Roots]

$9^2 = \boxed{81}$

21. [Substitution] *

If $r = 3$, find the value of $5r - 8$ $\boxed{7}$

16. [Order of Operations] *

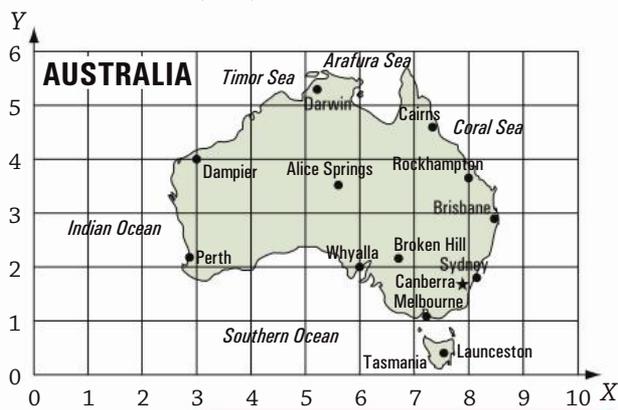
$5 \times 9 - 6 = \boxed{39}$

22. [Equations]

$16 - \boxed{7} = 9$

23. [Coordinates]

Which town is located at the coordinates (6,2)?



Whyalla

24. [Units of Measurement / Time] *

200 mm = 20 cm

25. [Perimeter] *

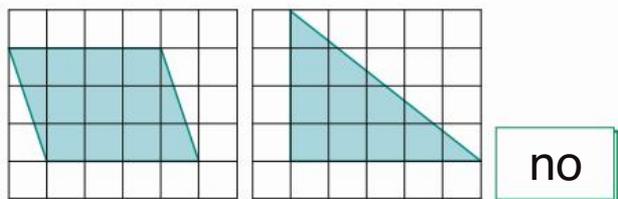
Use a ruler to find the perimeter of the polygon in centimetres.



21 cm

26. [Area / Volume]

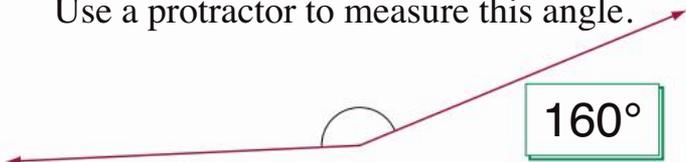
Do the parallelogram and the triangle have the same area?



no

27. [Shapes]

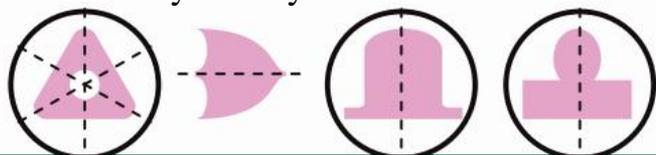
Use a protractor to measure this angle.



160°

28. [Location / Transformation]

Draw the axes of symmetry of these shapes. Circle the shapes that have vertical symmetry.



29. [Statistics]

Which food type has four times as much protein as brown bread?

Food (50 g)	proteins (g)	fats (g)	carbohydrates (g)
brown bread	4	0.9	24.6
fresh cream	1	11.5	1.5
chocolate	16	15.5	28
boiled egg	6.2	5.7	0.3
strawberry	0.45	0.35	8.6
tuna	12	0.4	0

chocolate

30. [Probability]

How many different outcomes are possible when choosing a vowel and choosing a card suit (spades, clubs, hearts or diamonds)? [Complete the table.]

Possible outcomes	vowel				
	a	e	i	o	u
card suit	S a,S	e,S	i,S	o,S	u,S
C	a,C	e,C	i,C	o,C	u,C
H	a,H	e,H	i,H	o,H	u,H
D	a,D	e,D	i,D	o,D	u,D

20

31. [Problem Solving 1] *

Caro painted this design in her art class. What is the ratio of the black portion of the design to the white portion?



1 : 3

32. [Problem Solving 2]

Complete the addition table.

+	3	8	5	4
2	5	10	7	6
6	9	14	11	10
12	15	20	17	16
9	12	17	14	13

33. [Problem Solving 3] *

To buy both the green (G) and blue (B) bikes would cost \$1500. To buy the green and red (R) bikes would cost \$750. To buy all three bikes would cost \$2000. How much does each bike cost?

G = \$250 B = \$1250 R = \$500



Name:

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Parent's Signature:

QUOTE OF THE WEEK

Practise yourself...in little things; and thence proceed to greater.
Epictetus

1. [+ Whole Numbers to 10]

	4	7	2	5	1	10	8	6	9	3
+ 10	14	17	12	15	11	20	18	16	19	13

2. [- Whole Numbers to 10]

	6	13	10	7	12	8	5	9	11	14
- 3	3	10	7	4	9	5	2	6	8	11

3. [× Whole Numbers to 12]

	5	8	11	6	9	12	10	7	3	4
× 5	25	40	55	30	45	60	50	35	15	20

4. [÷ Whole Numbers to 12]

	16	14	24	8	12	22	6	10	20	18
÷ 2	8	7	12	4	6	11	3	5	10	9

5. [Large Number +,-] *

$$8921 - 3506 = \boxed{5415}$$

6. [Large Number ×,÷] *

$$630000 \div 100 = \boxed{6300}$$

7. [Decimal +,-] *

$$3.68 + 4.51 = \boxed{8.19}$$

8. [Decimal ×,÷] *

$$60.5 \times 1000 = \boxed{60500}$$

9. [Fraction +,-] *

$$\frac{4}{5} + \frac{3}{5} = \boxed{1\frac{2}{5}}$$

10. [Fraction ×,÷] *

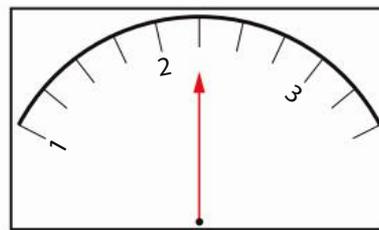
$$\frac{2}{5} \times 5 = \boxed{2}$$

11. [Percentages] *

Eighteen-carat rose gold is 75% gold, 9% silver and the rest copper. What percentage is copper? $\boxed{16\%}$

12. [Decimals / Fractions / Percents]

What decimal number is shown on this meter?



$\boxed{2.25}$

13. [Integers]

Use < or > to make a true statement.

$$-7 \quad \boxed{<} \quad -5$$

14. [Rates / Ratios]

Simplify the ratio

$$2 \text{ kg} : 8 \text{ kg} \quad \boxed{1:4}$$

15. [Indices / Square Roots]

$$0^2 = \boxed{0}$$

16. [Order of Operations] *

$$56 \div 7 + 1 = \boxed{9}$$

17. [Exploring Numbers]

What is the value of the underlined digit in the number 0.55?

$$\text{or } \frac{5}{100} \quad \boxed{0.05}$$

18. [Multiples / Factors / Primes] *

What is the lowest common multiple (LCM) of 5 and 6?

$\boxed{30}$

19. [Number Patterns]

Complete the pattern:

$$2, 2.3, 2.6, 2.9, \boxed{3.2}, \boxed{3.5}$$

20. [Expressions]

Simplify $hi + hi + hi + hi + hi$

$$\boxed{5hi}$$

21. [Substitution] *

If $t = 4$, find the value of $\frac{t+6}{5}$

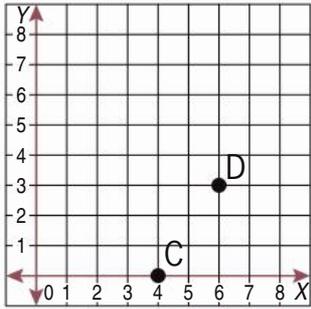
$$\boxed{2}$$

22. [Equations]

$$17 + \boxed{9} = 26$$

23. [Coordinates]

What are the coordinates of the points C and D on this Cartesian plane?



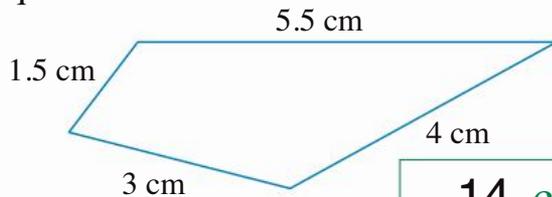
C(4, 0) D(6, 3)

24. [Units of Measurement / Time] *

46 cm = 460 mm

25. [Perimeter] *

Calculate the perimeter of the quadrilateral.

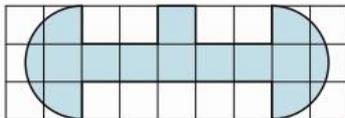


14 cm

26. [Area / Volume] *

Find the area of the shaded shape.

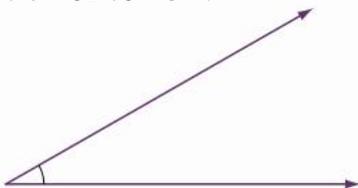
[Round to the nearest whole number.]



13 sq. units

27. [Shapes]

Without measuring, would you estimate that the size of this angle is closer to 30° or to 45°?



30°

28. [Location / Transformation]

Draw the axes of symmetry of these shapes. Circle the shapes that have horizontal symmetry.



29. [Statistics]

Of the animals that live for 15 years, which has the lowest heart rate?

Creature	Weight grams	Heart Rate beats/min	Longevity years
Human	90 000	60	70
Cat	2000	150	15
Dog	5000	90	15
Chicken	1500	275	15
Horse	1 200 000	44	40
Cow	800 000	65	22
Pig	150 000	70	25

dog

30. [Probability]

How many different outcomes are possible when rolling two dice?

[Complete the table.]

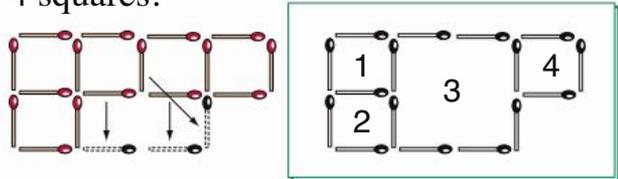


Possible outcomes	Die 1					
	1	2	3	4	5	6
Die 2	1,1	1,2	1,3	1,4	1,5	1,6
2	2,1	2,2	2,3	2,4	2,5	2,6
3	3,1	3,2	3,3	3,4	3,5	3,6
4	4,1	4,2	4,3	4,4	4,5	4,6
5	5,1	5,2	5,3	5,4	5,5	5,6
6	6,1	6,2	6,3	6,4	6,5	6,6

36

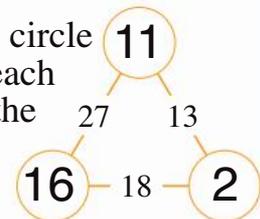
31. [Problem Solving 1]

By moving 3 matches to new positions, change the diagram so that there are 4 squares.



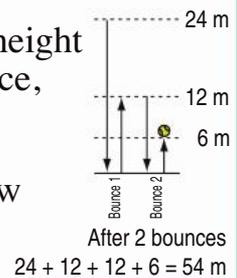
32. [Problem Solving 2] *

Enter a number in each circle so that the number on each line equals the sum of the numbers at each end.



33. [Problem Solving 3] *

A ball is dropped from a height of 24 m. With each bounce, the ball reaches a height that is half the height of the previous bounce. How far has the ball travelled by the time it comes to rest? [Hint: The answer is a whole number.]



72 m



Name:

Due Date: / /

Parent's Signature:

QUOTE OF THE WEEK

He that is without sin among you, let him cast the first stone.
JOHN 8 : 7

1. [+ Whole Numbers to 10]

	11	5	12	8	6	4	9	7	10	3
+ 5	16	10	17	13	11	9	14	12	15	8

2. [- Whole Numbers to 10]

	20	18	14	13	17	11	15	16	12	19
- 10	10	8	4	3	7	1	5	6	2	9

3. [× Whole Numbers to 12]

	12	8	7	11	4	6	3	9	5	10
× 4	48	32	28	44	16	24	12	36	20	40

4. [+ Whole Numbers to 12]

	4	11	8	12	7	10	6	9	3	5
÷ 1	4	11	8	12	7	10	6	9	3	5

5. [Large Number +,-] *

$$7605 - 1485 = \boxed{6120}$$

6. [Large Number ×,÷] *

$$504000 \div 1000 = \boxed{504}$$

7. [Decimal +,-] *

$$52.7 + 38.1 = \boxed{90.8}$$

8. [Decimal ×,÷] *

$$3.49 \times 1000 = \boxed{3490}$$

9. [Fraction +,-] *

$$\frac{16}{9} - \frac{2}{9} = \boxed{1\frac{5}{9}}$$

10. [Fraction ×,÷] *

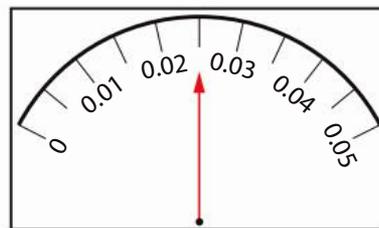
$$2 \times \frac{7}{8} = \boxed{1\frac{3}{4}}$$

11. [Percentages] *

Biofuel for a jet engine is made up of 50% jet A, 47.5% jatropa and the rest is algae. What percentage of the biofuel is algae? $\boxed{2.5\%}$

12. [Decimals / Fractions / Percents]

What decimal number is shown on this meter?



$\boxed{0.025}$

13. [Integers]

Arrange in descending order:

3, -3, -7, -9, 5

$\boxed{5, 3, -3, -7, -9}$

14. [Rates / Ratios] *

Simplify the ratio

40 cm : 2 m $\boxed{1 : 5}$

15. [Indices / Square Roots]

$$5^2 = \boxed{25}$$

16. [Order of Operations] *

$$30 - 15 \div 3 = \boxed{25}$$

17. [Exploring Numbers]

What is the value of the underlined digit in the number 6.029?

or $\frac{9}{1000}$ $\boxed{0.009}$

18. [Multiples / Factors / Primes] *

What is the lowest common multiple (LCM) of 9 and 12? $\boxed{36}$

19. [Number Patterns]

Complete the pattern:

8, 6.5, 5, 3.5, $\boxed{2, 0.5}$

20. [Expressions]

Simplify $ij + ij - ij - ij + ij$

\boxed{ij}

21. [Substitution] *

If $w = 2$, find the value of

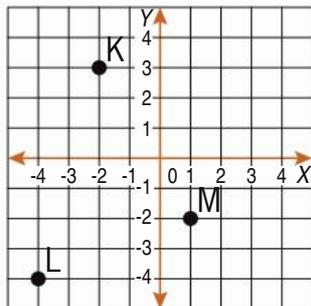
$$\frac{17 - w}{3} \quad \boxed{5}$$

22. [Equations]

$$\boxed{34} - 14 = 20$$

23. [Coordinates]

What are the coordinates of the points K, L and M on this Cartesian plane?



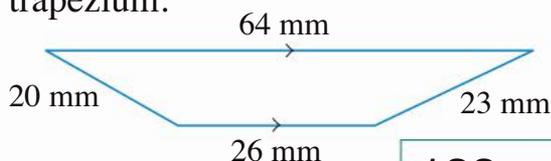
K(-2, 3) L(-4, -4) M(1, -2)

24. [Units of Measurement / Time] *

8.5 km = **8500** m

25. [Perimeter] *

Calculate the perimeter of the trapezium.

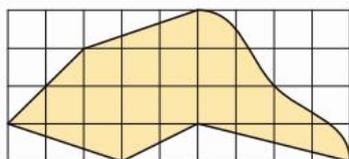


133 mm

26. [Area / Volume] *

Find the area of the shaded shape.

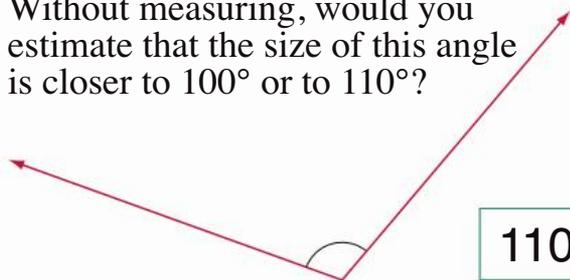
[Round to the nearest whole number.]



19 sq. units

27. [Shapes]

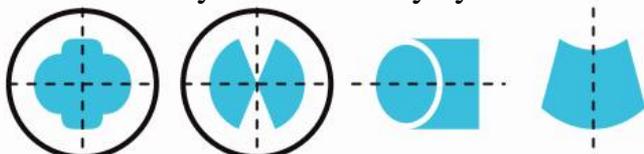
Without measuring, would you estimate that the size of this angle is closer to 100° or to 110° ?



110°

28. [Location / Transformation]

Draw the axes of symmetry of these shapes. Circle the shapes that are both horizontally and vertically symmetrical.



29. [Statistics] *

Approximately what percentage of nuclear plants under construction are being built in the USA?

A) 0.1% B) 7% C) 30% D) 50%

Commercial Nuclear Power Plants to July 2019	Nuclear Electricity generated		Nuclear plants - Operable		Nuclear plants - Under Construction		Uranium required 2019
	Twh	%e	Number	GWe	Number	GWe	tonnes
World	2563	19.3	447	399	55	58	65014
USA	808	10.3	97	99	4	5	18996

GWh = Gigawatt hour
GWe = Gigawatts electric

B

30. [Probability]

A coin is flipped 3 times. Given that order matters, (i.e. HTH \neq THH) find the size of the sample space.

[Complete the table.]

Outcomes (sample space)		
1st flip	2nd flip	3rd flip
H	H	H
H	H	T
H	T	H
H	T	T
T	H	H
T	H	T
T	T	H
T	T	T



8

31. [Problem Solving 1] *

Rearrange the letters of each set of words to form three mathematical terms: {LOVE SUM}, {LARGE CENT}, {BURN ME}

VOLUMES, RECTANGLE, NUMBER

32. [Problem Solving 2] *

A donkey (D) and a mule (M) were carrying sacks of apples. The donkey groaned so the mule said to him: "Why are you complaining? If you gave me one sack, I would have twice as many as you; if I gave you one of my sacks, then we would have equal loads." How many sacks was each carrying? [According to legend, Euclid was the author of this puzzle.]

D = 5 M = 7

33. [Problem Solving 3] *

A whole number is multiplied by six. What must the answer be?

A) a square number
B) a prime number
C) a number divisible by 12
D) a multiple of 3

D



Name:

Due Date: / /

Parent's Signature:

QUOTE OF THE WEEK

Standing in the middle of the road is very dangerous: you get knocked down by the traffic from both sides.
Margaret Thatcher

1. [+ Whole Numbers to 10]

	24	11	16	9	15	22	7	18	20	13
+ 2	26	13	18	11	17	24	9	20	22	15

2. [- Whole Numbers to 10]

	25	28	10	14	12	17	26	9	11	23
- 5	20	23	5	9	7	12	21	4	6	18

3. [× Whole Numbers to 12]

	4	12	8	11	5	6	3	7	10	9
× 7	28	84	56	77	35	42	21	49	70	63

4. [+ Whole Numbers to 12]

	66	30	60	24	36	42	72	54	18	48
÷ 6	11	5	10	4	6	7	12	9	3	8

5. [Large Number +, -] *

6043 + 2875 = **8918**

12. [Decimals / Fractions / Percents]

Simplify $\frac{6}{8}$ **$\frac{3}{4}$**

17. [Exploring Numbers]

In which number does the digit 2 have greater value? A) 1042 B) 204 **B**

6. [Large Number ×, ÷] *

1826 × 100 = **182 600**

13. [Integers] *

Mauna Loa, a volcanic mountain in Hawaii, stands 4170 m above sea level and extends to 5000 m below sea level. What is the total height of Mauna Loa?

9170 m

18. [Multiples / Factors / Primes] *

Is 7 a factor of 294? **yes**

7. [Decimal +, -] *

4.87 - 0.95 = **3.92**

19. [Number Patterns]

Complete the table:

Lamborghini

hwy distance (km)	4.5	9	13.5	18	22.5
fuel usage (litres)	1	2	3	4	5

8. [Decimal ×, ÷] *

8 × 0.9 = **7.2**

14. [Rates / Ratios] *

At full speed, a downhill skier travels at 31 m/s. At this speed how far will the skier travel in 60 seconds?

1860 m

20. [Expressions]

Simplify $3x + x$ **4x**

9. [Fraction +, -] *

$2\frac{3}{7} - 1\frac{4}{7} =$ **$\frac{6}{7}$**

21. [Substitution] *

If $c = -6$, find the value of $c + 12$ **6**

10. [Fraction ×, ÷] *

$\frac{1}{4}$ of 12 kg = **3 kg**

15. [Indices / Square Roots]

$10^1 =$ **10**

11. [Percentages]

65% of \$100 = **\$ 65**

16. [Order of Operations] *

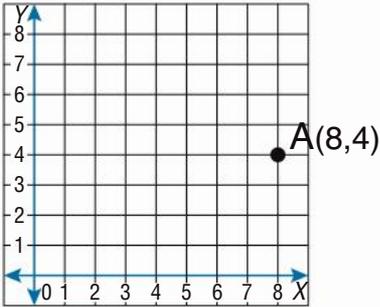
$(54 - 6) \div 6 =$ **8**

22. [Equations]

5 × 8 = 40

23. [Rules / Graphs]

Plot point A at coordinates (8,4) on this Cartesian plane.

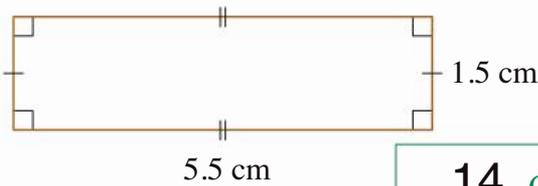


24. [Units of Measurement / Time] *

5 kg = **5000** g

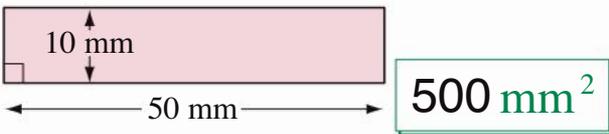
25. [Perimeter] *

Calculate the perimeter of the rectangle.



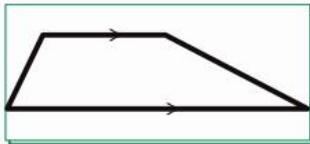
26. [Area / Volume] *

Using $A = lw$ find the area of the rectangle.



27. [Shapes]

Draw a trapezium marking the pair of parallel sides.

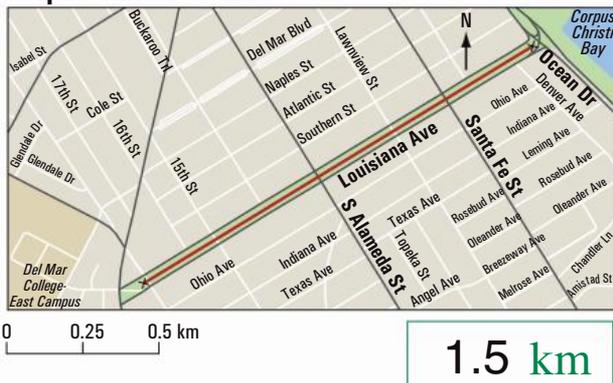


28. [Location / Transformation]

Using the scale, how long is the marked distance along Louisiana Avenue?

[Answer to the nearest half kilometre.]

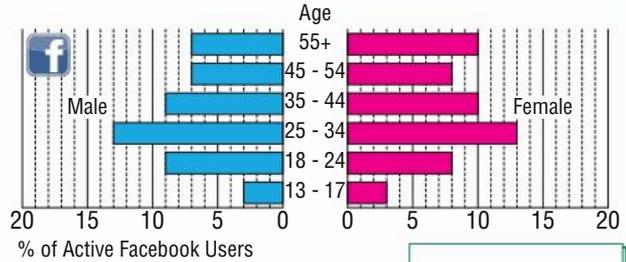
Corpus Christi - Texas



29. [Statistics]

Which age group has a higher percentage of male users than female users of Facebook?

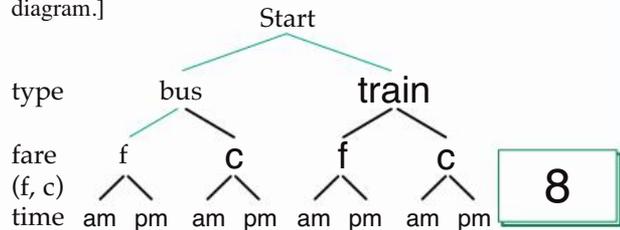
Age and gender distribution of Facebook users in Australia (Jan 2018)



18 - 24

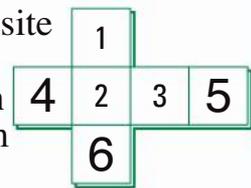
30. [Probability]

How many different outcomes are possible if you can choose between a bus or a train, full fare or concession and you can travel in the morning (am) or the afternoon (pm)? [Complete the tree diagram.]



31. [Problem Solving 1]

On a standard die, opposite sides add to 7. Fill in the spaces so that, when folded, the net will form a standard die.



32. [Problem Solving 2] *

Cassandra had a pair of mice. The female gave birth to eight pups, four male and four female. In the next term, the five female mice each gave birth to eight pups, again four male and four female. If, in the next term, each female does the same and no mice die, how many mice, male and female, will Cassandra now have?

male = 125 female = 125

33. [Problem Solving 3] *

Four darts are thrown at this dartboard. If all four darts hit the board, how many different point totals are possible? [Dartboard regions are 1, 4, 7 & 10 points.]



13



Name:

Due Date: / /

Parent's Signature:

QUOTE OF THE WEEK

Not doing more than the average is what keeps the average down.
William M. Winans

1. [+ Whole Numbers to 10]

	4	17	15	3	10	2	6	9	18	11
+ 7	11	24	22	10	17	9	13	16	25	18

2. [- Whole Numbers to 10]

	25	13	28	22	10	6	19	11	24	27
- 1	24	12	27	21	9	5	18	10	23	26

3. [× Whole Numbers to 12]

	7	10	5	9	12	6	4	3	8	11
× 6	42	60	30	54	72	36	24	18	48	66

4. [+ Whole Numbers to 12]

	56	88	48	64	96	40	72	80	24	32
÷ 8	7	11	6	8	12	5	9	10	3	4

5. [Large Number +, -] *

$$5824 + 1503 = \boxed{7327}$$

12. [Decimals / Fractions / Percents]

Simplify $\frac{24}{30}$ $\boxed{\frac{4}{5}}$

17. [Exploring Numbers]

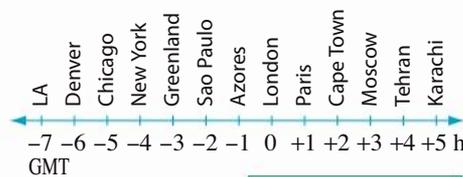
In which number does the digit 5 have greater value? A) 590 B) 7059 \boxed{A}

6. [Large Number ×, ÷] *

$$307 \times 1000 = \boxed{307\,000}$$

13. [Integers] *

What is the time difference in hours between Moscow and New York?



$$\boxed{7\text{ h}}$$

18. [Multiples / Factors / Primes] *

Is 230 divisible by 4? $\boxed{\text{no}}$

7. [Decimal +, -] *

$$27.4 - 8.3 = \boxed{19.1}$$

19. [Number Patterns]

Complete the table:

Recycled and composted waste/person						
No. of days	1	2	3	4	5	6
Weight (kg)	0.7	1.4	2.1	2.8	3.5	4.2

8. [Decimal ×, ÷] *

$$5.4 \times 6 = \boxed{32.4}$$

14. [Rates / Ratios] *

A raindrop falls at 200 m per minute. How long will it take a raindrop to travel 6000 m?

$$\boxed{30\text{ min}}$$

20. [Expressions]

Simplify $5xy - xy$ $\boxed{4xy}$

9. [Fraction +, -] *

$$1\frac{1}{4} + 2\frac{1}{4} = \boxed{3\frac{1}{2}}$$

21. [Substitution] *

If $k = -5$, find the value of $-7k$ $\boxed{35}$

10. [Fraction ×, ÷] *

$$\frac{1}{3} \text{ of } \$120 = \boxed{\$40}$$

15. [Indices / Square Roots]

$$10^2 = \boxed{100}$$

11. [Percentages] *

$$25\% \text{ of } \$300 = \boxed{\$75}$$

16. [Order of Operations] *

$$(8 - 3) \times 7 = \boxed{35}$$

22. [Equations]

$$\boxed{-10} \times 6 = -60$$

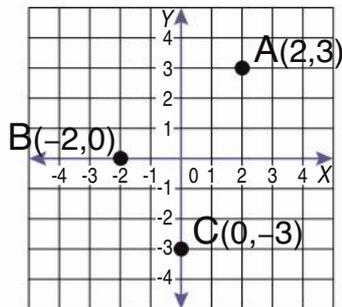
23. [Coordinates]

Plot the following points on this Cartesian plane:

A at coordinates (2,3)

B at coordinates (-2,0)

C at coordinates (0,-3)



24. [Units of Measurement / Time] *

2000 g = 2 kg

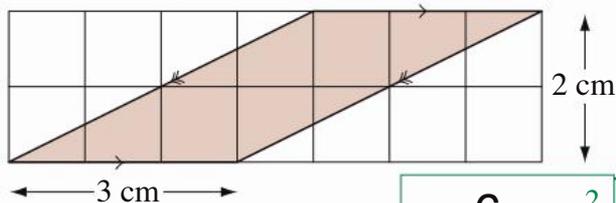
25. [Perimeter] *

Calculate the perimeter of an equilateral triangle with a side length of 30 mm.

90 mm

26. [Area / Volume] *

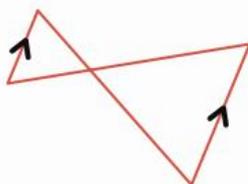
Using Area = base × height, find the area of the parallelogram.



6 cm²

27. [Shapes]

Use arrows to show the pair of parallel lines in this diagram.



28. [Location / Transformation]

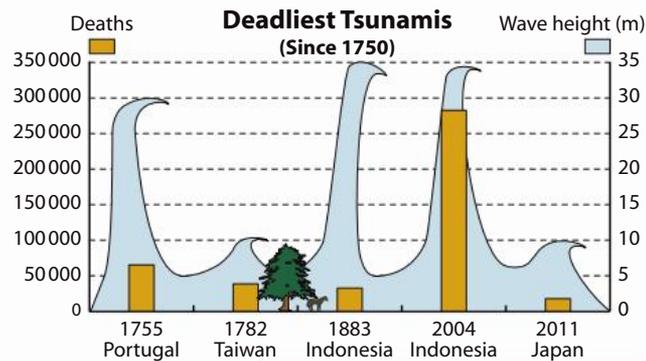
Using the scale, estimate to the nearest 100 metres the marked distance from Place des Pyramides to Place du Louvre.



2400 m

29. [Statistics]

For which tsunami is the ratio **deaths : wave height** the greatest?

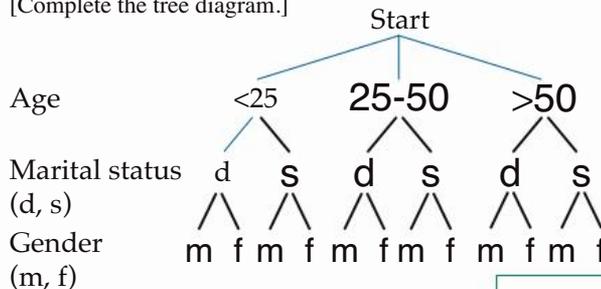


2004 Indonesia

30. [Probability]

How many different insurance options does a company need to consider when offering rates according to age (<25, 25-50, >50), marital status (de facto, single) and gender (male, female)?

[Complete the tree diagram.]



12

31. [Problem Solving 1] *

If you divide a number by 6, add 2, multiply by 3 and subtract 5, the result is 10. What is the number?

18

32. [Problem Solving 2] *

How many different flags with 3 stripes are possible, using the colours red (R), blue (B) and yellow (Y)? Each colour may be used more than once in each flag. [Consider YYY as 3 stripes.]



27

33. [Problem Solving 3] *

A number that is equal to the sum of all its factors, other than itself, is a *perfect number*.

For example: $6 = 1 + 2 + 3$

Therefore 6 is a perfect number. Which of the numbers 20, 24, 28 and 32 is also a perfect number?

28



Name:

Due Date: / /

Parent's Signature:

QUOTE OF THE WEEK

Simon's Law - Everything put together falls apart sooner or later; usually sooner.
Rossiter

1. [+ Whole Numbers to 10]

	25	11	9	22	26	19	24	17	10	3
+ 4	29	15	13	26	30	23	28	21	14	7

2. [- Whole Numbers to 10]

	27	12	13	18	24	11	15	22	29	10
- 6	21	6	7	12	18	5	9	16	23	4

3. [× Whole Numbers to 12]

	9	6	5	11	4	8	10	1	7	3
× 11	99	66	55	121	44	88	110	11	77	33

4. [+ Whole Numbers to 12]

	14	42	7	63	35	70	28	49	21	56
÷ 7	2	6	1	9	5	10	4	7	3	8

5. [Large Number +, -] *

$$5273 + 1490 = \boxed{6763}$$

12. [Decimals / Fractions / Percents]

Simplify $\frac{12}{16}$ $\boxed{\frac{3}{4}}$

17. [Exploring Numbers]

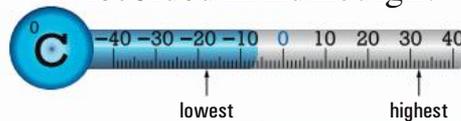
In which number does the digit 7 have greater value? A) 9.751 B) 7.09 \boxed{B}

6. [Large Number ×, ÷] *

$$349 \times 600 = \boxed{209\,400}$$

13. [Integers] *

What is the difference between the highest and lowest temperatures recorded in Edinburgh?



$\boxed{50\text{ }^{\circ}\text{C}}$

18. [Multiples / Factors / Primes]

List all the factors of 24 in ascending order.

$\boxed{1, 2, 3, 4, 6, 8, 12, 24}$

7. [Decimal +, -] *

$$8.62 - 3.59 = \boxed{5.03}$$

19. [Number Patterns]

Complete the table:

Waste generation/person

No. of days	1	2	3	4	5	6
Weight (kg)	2.1	4.2	6.3	8.4	10.5	12.6

8. [Decimal ×, ÷] *

$$3.61 \times 3 = \boxed{10.83}$$

14. [Rates / Ratios] *

On average, women walk at a speed of 80 m/min. At this rate how far would a woman walk in an hour?

$\boxed{4800\text{ m}}$

20. [Expressions]

Simplify $5q - 4q + q$ $\boxed{2q}$

9. [Fraction +, -] *

$$3\frac{5}{12} + 2\frac{1}{12} = \boxed{5\frac{1}{2}}$$

10. [Fraction ×, ÷] *

$$\frac{2}{5} \text{ of } 30\text{ m} = \boxed{12\text{ m}}$$

15. [Indices / Square Roots]

$$10^5 = \boxed{100\,000}$$

21. [Substitution] *

If $q = -18$, find the value of $\frac{q}{3}$ $\boxed{-6}$

11. [Percentages] *

$$5\% \text{ of } \$5.00 = \boxed{25\text{ }^{\circ}$$

16. [Order of Operations] *

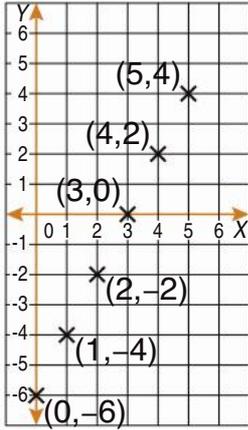
$$36 \div (9 - 3) = \boxed{6}$$

22. [Equations]

$$-5 \times \boxed{-9} = 45$$

23. [Coordinates]

Draw crosses at the following points: (0,-6), (1,-4), (2,-2), (3,0), (4,2), (5,4)

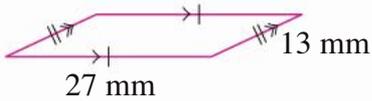


24. [Units of Measurement / Time] *

4 t = **4000** kg

25. [Perimeter] *

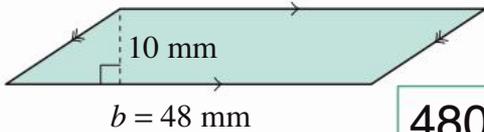
Calculate the perimeter of the parallelogram.



80 mm

26. [Area / Volume] *

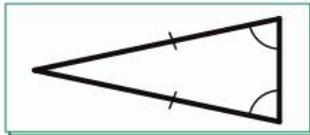
Using $A = bh$ find the area of the parallelogram.



480 mm²

27. [Shapes]

Draw an isosceles acute-angled triangle marking the congruent sides and congruent angles.



28. [Location / Transformation]

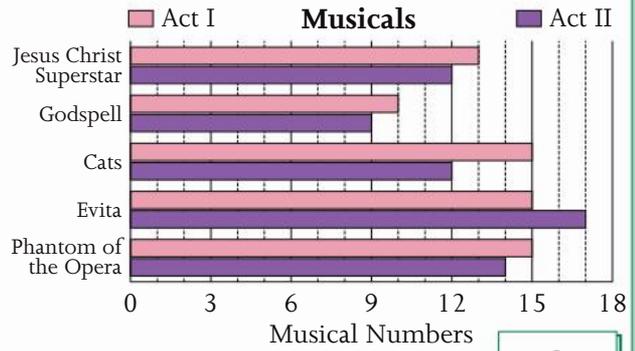
A plane flies from Manaus to Salvador. Using the scale, estimate to the nearest 1000 km the distance travelled.



5000 km

29. [Statistics]

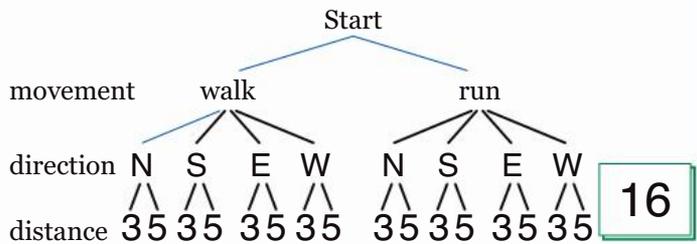
Of the musicals shown, how many have 15 musical numbers in Act I?



3

30. [Probability]

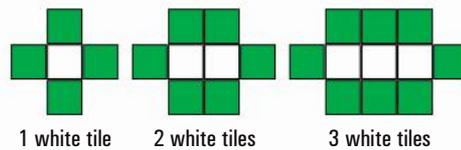
During an orienteering activity, Lara must decide whether to walk or run in one direction (N, S, E or W) for 3 km or 5 km. How many different options does Lara have? [Complete the tree diagram.]



16

31. [Problem Solving 1] *

How many green tiles are needed to go around 10 white tiles using the pattern shown?



22

32. [Problem Solving 2] *

Fill in the magic square. [Every row, column and diagonal has the same sum.]

1	16	7	10
13	4	11	6
12	5	14	3
8	9	2	15

33. [Problem Solving 3] *

A clay target team has a surprising number of one-legged members. All these members wear a boot. Of the remainder of the twenty-two members, only half choose to wear boots, the others go barefoot. How many boots are worn by the team?

22



Name:

Due Date: / /

Parent's Signature:

QUOTE OF THE WEEK

Holiday - Two weeks off, often followed by two off weeks.

1. [+ Whole Numbers to 10]

	23	19	8	20	5	12	17	16	24	11
+ 6	29	25	14	26	11	18	23	22	30	17

2. [- Whole Numbers to 10]

	11	23	12	16	25	24	10	29	17	8
- 4	7	19	8	12	21	20	6	25	13	4

3. [× Whole Numbers to 12]

	7	3	1	10	9	4	8	2	5	6
× 1	7	3	1	10	9	4	8	2	5	6

4. [+ Whole Numbers to 12]

	12	22	18	8	10	14	24	16	20	6
÷ 2	6	11	9	4	5	7	12	8	10	3

5. [Large Number +, -] *

$$4362 + 2081 = \boxed{6443}$$

12. [Decimals / Fractions / Percents]

Simplify $\frac{30}{45}$ $\boxed{\frac{2}{3}}$

17. [Exploring Numbers]

In which number does the digit 6 have greater value? A) 0.687 B) 1.467 \boxed{A}

6. [Large Number ×, ÷] *

$$50 \times 1500 = \boxed{75\,000}$$

13. [Integers] *

The lowest point in China is Turpan Pendi at -154 m and the highest point is Mt Everest at 8850 m. What is the height difference?

$$\boxed{9004 \text{ m}}$$

18. [Multiples / Factors / Primes]

List all the factors of 54 in ascending order.

$$\boxed{1, 2, 3, 6, 9, 18, 27, 54}$$

7. [Decimal +, -] *

$$9.64 - 5.37 = \boxed{4.27}$$

8. [Decimal ×, ÷] *

$$8 \times 4.072 = \boxed{32.576}$$

14. [Rates / Ratios] *

A space shuttle travelled 720 000 km in 24 hours in orbit. What was its average speed?

$$\boxed{30\,000 \text{ km/h}}$$

19. [Number Patterns]

Complete the table:

Polygons					
sides	3	4	5	6	7
sum of interior angles	180	360	540	720	900

9. [Fraction +, -] *

$$4\frac{1}{7} - 2\frac{6}{7} = \boxed{1\frac{2}{7}}$$

20. [Expressions]

Simplify $2s - s + 6s$ $\boxed{7s}$

10. [Fraction ×, ÷] *

$$\frac{3}{10} \text{ of } 100 \text{ L} = \boxed{30 \text{ L}}$$

15. [Indices / Square Roots]

$$10^6 = \boxed{1\,000\,000}$$

21. [Substitution] *

If $r = -4$, find the value of $3r - 9$ $\boxed{-21}$

11. [Percentages] *

$$30\% \text{ of } \$6.00 = \boxed{\$1.80}$$

16. [Order of Operations] *

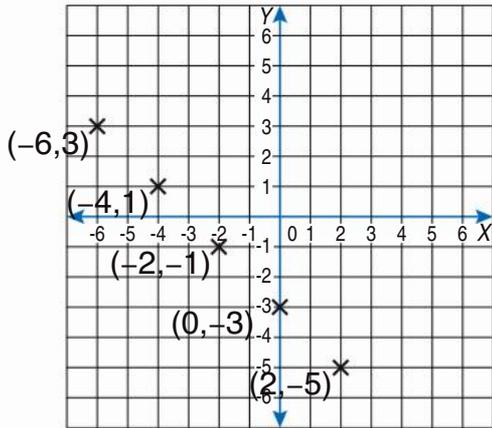
$$9 \times (11 - 7) = \boxed{36}$$

22. [Equations]

$$9 \times \boxed{-4} = -36$$

23. [Coordinates]

Draw crosses at the following points: $(-6,3)$, $(-4,1)$, $(-2,-1)$, $(0,-3)$, $(2,-5)$

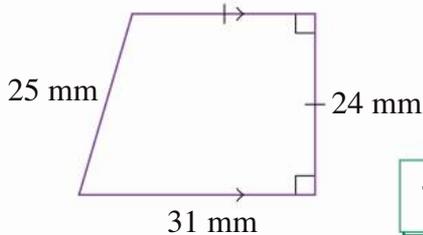


24. [Units of Measurement / Time] *

7.2 kg = **7200** g

25. [Perimeter] *

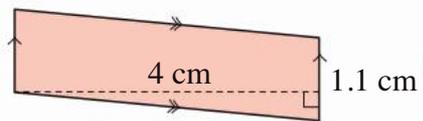
Calculate the perimeter of the trapezium.



104 mm

26. [Area / Volume] *

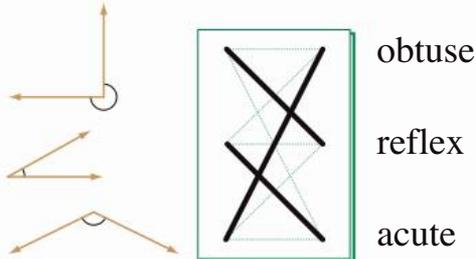
Find the area of the parallelogram.



4.4 cm²

27. [Shapes]

Match each angle to its description:



28. [Location / Transformation]

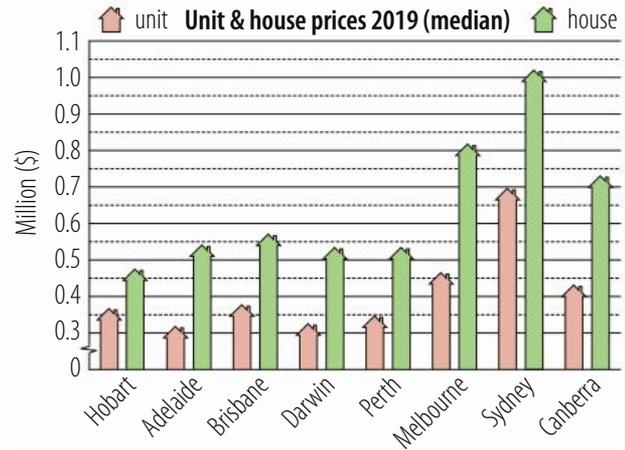
Using the scale, estimate to the nearest 100 km the marked distance from Vientiane (Laos) to Phnom Penh (Cambodia).



700 km

29. [Statistics]

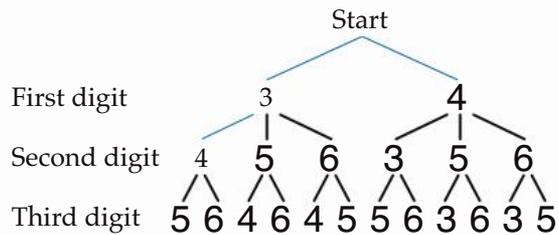
Which city has the greatest difference between unit and house prices?



Melbourne

30. [Probability]

How many different 3-digit numbers less than 500 can be made using the digits 3, 4, 5 and 6 if the digits can be used only once? [Complete the tree diagram.]



12

31. [Problem Solving 1] *

Igor wants to fit his photo, 3 cm high and 2 cm wide, in the newspaper. The available space is 9 cm high. If the photo is enlarged proportionally to fit in the newspaper, what width will the photo become?

6 cm

32. [Problem Solving 2] *

Find the value of the product:

$$\frac{3}{5} \times \frac{5}{7} \times \frac{7}{9} \times \frac{9}{11} \times \frac{11}{13} \times \frac{13}{15} =$$

$\frac{1}{5}$

33. [Problem Solving 3] *

The sum of the digits of 2014 is 7. How many whole numbers between 100 and 999 have 9 as the sum of their digits?

45



Name:

Due Date: / /

Parent's Signature:

QUOTE OF THE WEEK

It is never too late to learn, but we sometimes learn when it is too late.
W.G.P.

1. [+ Whole Numbers to 10]

	8	13	1	10	12	5	14	17	9	16
+ 3	11	16	4	13	15	8	17	20	12	19

2. [- Whole Numbers to 10]

	14	19	13	15	7	12	20	16	8	11
- 7	7	12	6	8	0	5	13	9	1	4

3. [× Whole Numbers to 12]

	11	6	3	10	8	7	4	9	12	5
× 10	110	60	30	100	80	70	40	90	120	50

4. [÷ Whole Numbers to 12]

	110	44	66	33	99	55	22	77	121	88
÷ 11	10	4	6	3	9	5	2	7	11	8

5. [Large Number +, -] *

$$2544 - 1347 = \boxed{1197}$$

6. [Large Number ×, ÷] *

$$3150 \div 5 = \boxed{630}$$

7. [Decimal +, -] *

$$36.8 + 54.8 = \boxed{91.6}$$

8. [Decimal ×, ÷] *

$$0.54 \div 6 = \boxed{0.09}$$

9. [Fraction +, -] *

$$2 - \frac{7}{9} = \boxed{1\frac{2}{9}}$$

10. [Fraction ×, ÷] *

$$5 \div \frac{1}{3} = \boxed{15}$$

11. [Percentages] *

$$75\% \text{ of } 480 = \boxed{360}$$

12. [Decimals / Fractions / Percents]

Complete the equivalent fractions:

$$\frac{2}{5} = \frac{\boxed{18}}{45}$$

13. [Integers]

From the food court Lill rides the elevator up 3 levels and then down 6. At which level is Lill now?



carpark (C)

14. [Rates / Ratios] *

The Shortfin Mako shark can swim 50 km per hour. At this rate how far can it swim in half an hour?

25 km

15. [Indices / Square Roots]

$$\sqrt{100} = \boxed{10}$$

16. [Order of Operations] *

$$9 - 20 \div (2 + 3) = \boxed{5}$$

17. [Exploring Numbers]

Express in numerals: two thousand, one hundred and fifteen

2115

18. [Multiples / Factors / Primes] *

List all the common factors of 28 and 42.

1, 2, 7, 14

19. [Number Patterns]

Complete the pattern:

$$\frac{3}{16}, \frac{3}{4}, 3, 12, \boxed{48}, \boxed{192}$$

20. [Expressions]

Write as an expression: The sum of a and c

$a + c$

21. [Substitution] *

If $e = -13$ and $f = 8$, find the value of $e + f$

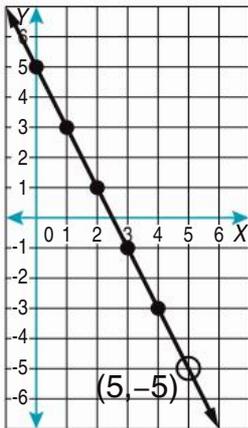
-5

22. [Equations] *

$$\frac{2}{3} \text{ of } \boxed{27} = 18$$

23. [Coordinates]

These dots, if joined, would form a line. Another point on this line has a y-coordinate of -5. What is the x-coordinate of this point?



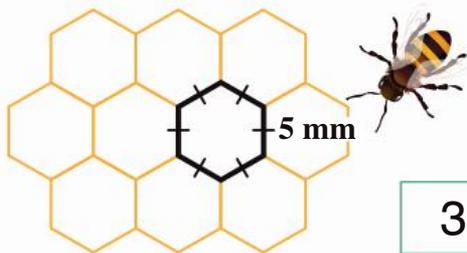
(5 , -5)

24. [Units of Measurement / Time] *

210 m = 21 000 cm

25. [Perimeter] *

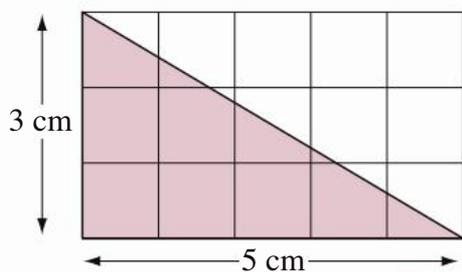
What is the perimeter of one hexagonal section of honeycomb?



30 mm

26. [Area / Volume] *

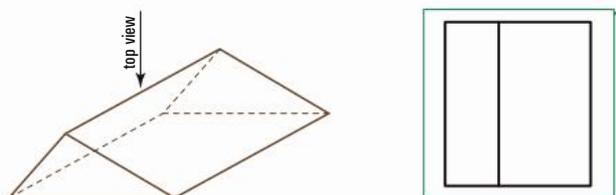
Using $\text{Area} = \frac{1}{2} \times \text{base} \times \text{height}$, find the area of the triangle.



7.5 cm²

27. [Shapes]

Sketch the top view of this solid.



28. [Location / Transformation]

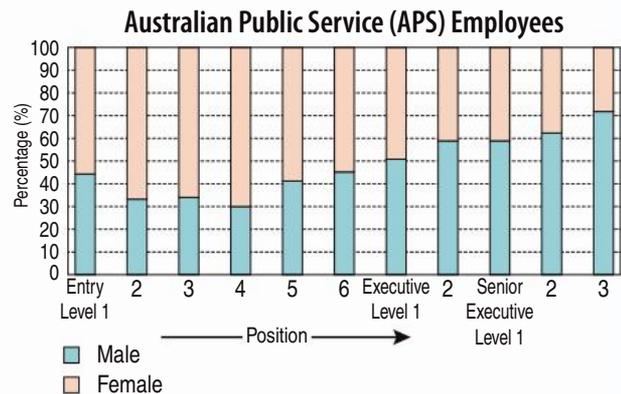
By how many degrees must this shape be rotated to first match the original position?



90°

29. [Statistics]

For which level in the Australian Public Service do females make up 70% of the workers?



entry level 4

30. [Probability] *

A 52 card deck of playing cards is shuffled and one card is dealt from the top of the deck. What is the probability that it will be a Queen? [Give your answer as a fraction in simplest form.]



1/13

31. [Problem Solving 1] *

How many numbers between 1 and 400 are divisible by 7?

57

32. [Problem Solving 2] *

Find the last digit of 6^{30} .

6

33. [Problem Solving 3] *

Pink rose plants are on sale for \$3 each and white ones for \$5 each. A gardener decides to buy 13 in total, choosing more white plants than pink. If the gardener spent \$55, how many white plants did he buy?

8



Name:

Due Date: / /

Parent's Signature:

QUOTE OF THE WEEK

The good thing about having an unlisted phone number is that if you get a crank call you know it is from a friend.

1. [+ Whole Numbers to 10]

	2	16	20	9	15	14	11	8	7	13
+ 5	7	21	25	14	20	19	16	13	12	18

2. [- Whole Numbers to 10]

	4	22	10	15	18	3	21	7	16	19
- 3	1	19	7	12	15	0	18	4	13	16

3. [× Whole Numbers to 12]

	5	12	6	11	7	8	3	9	4	10
× 2	10	24	12	22	14	16	6	18	8	20

4. [÷ Whole Numbers to 12]

	70	40	30	60	90	120	80	50	110	100
÷ 10	7	4	3	6	9	12	8	5	11	10

5. [Large Number +, -] *

$$3425 - 863 = \boxed{2562}$$

6. [Large Number ×, ÷] *

$$3054 \div 6 = \boxed{509}$$

7. [Decimal +, -] *

$$2.78 + 3.97 = \boxed{6.75}$$

8. [Decimal ×, ÷] *

$$1.89 \div 7 = \boxed{0.27}$$

9. [Fraction +, -] *

$$3 - 1\frac{3}{8} = \boxed{1\frac{5}{8}}$$

10. [Fraction ×, ÷] *

$$4 \div \frac{4}{5} = \boxed{5}$$

11. [Percentages] *

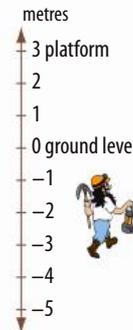
$$35\% \text{ of } 80 = \boxed{28}$$

12. [Decimals / Fractions / Percents]

Complete the equivalent fractions: $\frac{20}{48} = \frac{5}{\boxed{12}}$

13. [Integers]

Starting from the platform, Clem rides 5 m down the mine shaft, and then continues 2 m further down. Where is Clem now?



$$\boxed{-4 \text{ m}}$$

17. [Exploring Numbers]

Express in numerals: twenty-four thousand and fifty

$$\boxed{24\,050}$$

18. [Multiples / Factors / Primes] *

List all the common factors of 32 and 80.

$$\boxed{1, 2, 4, 8, 16}$$

14. [Rates / Ratios] *

A tortoise, or land turtle, might move 150 m in half an hour. What is this speed in metres per minute?

$$\boxed{5 \text{ m/min}}$$

19. [Number Patterns]

Complete the pattern:

$$0.2, 0.6, 1.8, 5.4, \boxed{16.2}, \boxed{48.6}$$

20. [Expressions]

Write as an expression: A number that is equal to 80 less than x

$$\boxed{x - 80}$$

15. [Indices / Square Roots]

$$\sqrt{16} = \boxed{4}$$

21. [Substitution] *

If $t = 15$ and $u = 9$, find the value of $t - u$

$$\boxed{6}$$

16. [Order of Operations] *

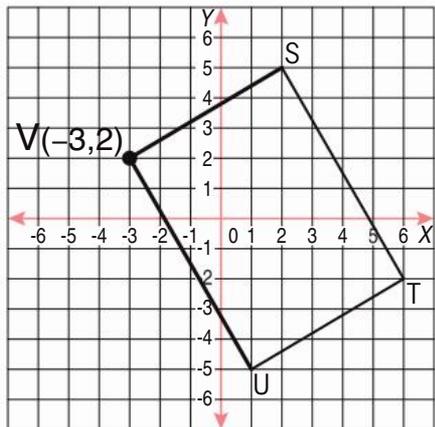
$$38 \div (4 + 15) + 9 = \boxed{11}$$

22. [Equations] *

$$\frac{1}{4} \times \boxed{-8} = -2$$

23. [Coordinates]

What are the coordinates of point V that will make STUV a rectangle?



(-3, 2)

24. [Units of Measurement / Time] *

5.4 m = **5400** mm

25. [Perimeter] *

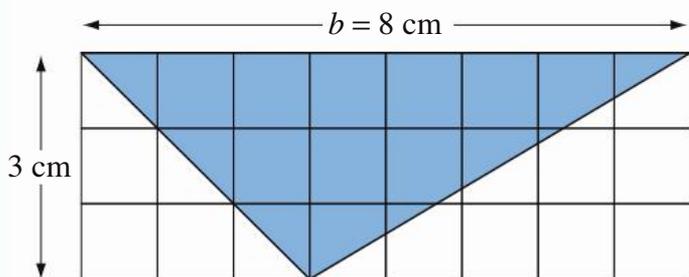
What is the perimeter of the Australian 50 cent coin? [Hint: 12 sides]



96 mm

26. [Area / Volume] *

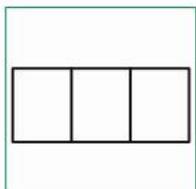
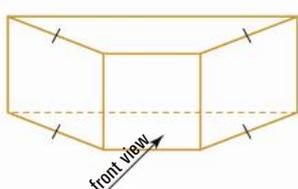
Using $A = \frac{1}{2}bh$ find the area of the triangle.



12 cm²

27. [Shapes]

Sketch the front view of this solid.



28. [Location / Transformation]

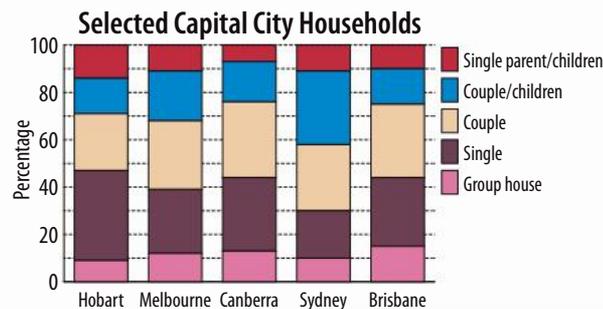
By how many degrees must this shape be rotated to first match the original position?



45°

29. [Statistics]

Which capital city has 20% of their households housing a single resident?



Sydney

30. [Probability] *

If a letter tile is chosen at random, find the probability of choosing a consonant. [Give your answer as a fraction in simplest form.]



$\frac{1}{2}$

31. [Problem Solving 1] *

The sum of five consecutive, whole numbers is 40. What are the five numbers?

6, 7, 8, 9, 10

32. [Problem Solving 2] *

Fifteen toothpicks are used to make three hexagons. Find the minimum number of extra toothpicks required to extend the pattern to seven hexagons.



15

33. [Problem Solving 3] *

Madeline invests \$3000. At the end of each year she receives 10% interest on the total balance for that year. What is her balance at the end of the third year?

\$ 3993



Name:

Due Date: / /

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QUOTE OF THE WEEK

Never discourage anyone who continually makes progress, no matter how slow.
Plato

1. [+ Whole Numbers to 10]

	1	5	8	12	16	9	13	17	10	14
+ 2	3	7	10	14	18	11	15	19	12	16

2. [- Whole Numbers to 10]

	16	9	13	25	17	12	10	21	14	8
- 6	10	3	7	19	11	6	4	15	8	2

3. [× Whole Numbers to 12]

	6	12	7	11	3	8	10	5	9	4
× 5	30	60	35	55	15	40	50	25	45	20

4. [+ Whole Numbers to 12]

	21	9	15	30	36	18	33	27	24	6
÷ 3	7	3	5	10	12	6	11	9	8	2

5. [Large Number +,-] *

$$4901 - 512 = \boxed{4389}$$

6. [Large Number ×,÷] *

$$1736 \div 7 = \boxed{248}$$

7. [Decimal +,-] *

$$9.38 + 4.71 = \boxed{14.09}$$

8. [Decimal ×,÷] *

$$265.9 \div 100 = \boxed{\$ 2600}$$

9. [Fraction +,-] *

$$2 - 1\frac{2}{5} = \boxed{\frac{3}{5}}$$

10. [Fraction ×,÷] *

$$2 \div \frac{3}{7} = \boxed{4\frac{2}{3}}$$

11. [Percentages] *

$$30\% \text{ of } 15 = \boxed{4.5}$$

12. [Decimals / Fractions / Percents]

Complete the equivalent fractions:

$$\frac{2}{3} = \frac{6}{9} = \frac{\boxed{36}}{54}$$

13. [Integers] *

You bought \$2000 worth of shares. After the first year you lost \$650 but after the second year you gained \$1250. What is the current value of your shares?

$$\boxed{\$ 2600}$$

14. [Rates / Ratios] *

Greyhounds are the fastest dogs, reaching speeds of 70 km/h. At this rate how long does it take a greyhound to run 14 km?

$$\boxed{12 \text{ min}}$$

15. [Indices / Square Roots]

$$\sqrt{144} = \boxed{12}$$

16. [Order of Operations] *

$$11 - (14 - 8) \div 2 = \boxed{8}$$

17. [Exploring Numbers]

Write the number 20 300 in words.

$\boxed{\text{twenty thousand, three hundred}}$

18. [Multiples / Factors / Primes] *

What is the highest common factor (HCF) of 40 and 72?

$$\boxed{8}$$

19. [Number Patterns]

Complete the pattern:

$$256, 64, 16, 4, \boxed{1, \frac{1}{4}}$$

20. [Expressions]

Write as an expression: A number that is equal to forty times m

$$\boxed{40m}$$

or $40 \times m$

21. [Substitution] *

If $v = 18$ and $w = 2$, find the value of

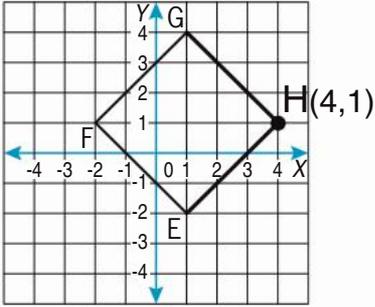
$$\frac{v}{w} = \boxed{9}$$

22. [Equations] *

$$\frac{1}{6} \times \boxed{-24} = -4$$

23. [Coordinates]

What are the coordinates of point H that will make EFGH a square?



(4, 1)

24. [Units of Measurement / Time] *

700 m = 0.7 km

25. [Perimeter] *

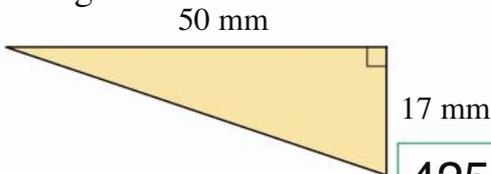
What is the perimeter on the outside of the Flatiron Building in New York?



137.5 m

26. [Area / Volume] *

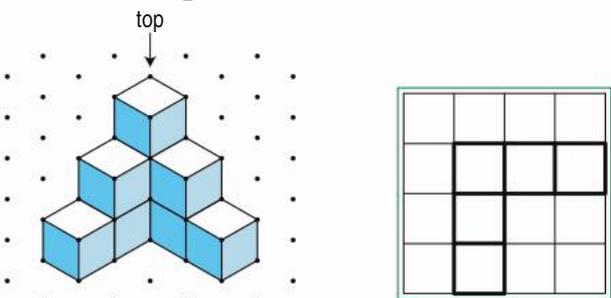
Find the area of the right-angled triangle.



425 mm²

27. [Shapes]

Draw the top view of this solid.



28. [Location / Transformation]

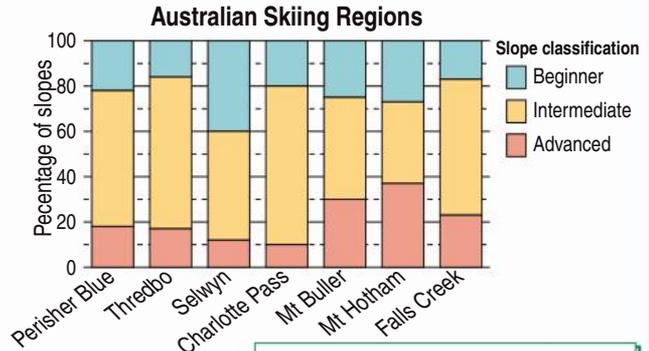
By how many degrees must this shape be rotated to first match the original position?



60°

29. [Statistics]

Which skiing region has the greatest percentage of their slopes classified as intermediate?



Charlotte Pass

30. [Probability] *

When the spinner is spun once, what is the probability of spinning a consonant? [Give your answer as a fraction in simplest form.]



$\frac{3}{4}$

31. [Problem Solving 1] *

If you have 5¢, 20¢ and 50¢ coins, in how many ways can you make up exactly \$1?

10

32. [Problem Solving 2] *

A family of kittens likes to climb our fruit trees. If one kitten climbs on each tree, there is one kitten without a tree. If two kittens climb on each tree, there is one unoccupied tree. How many kittens and how many trees are there?

kittens = 4 trees = 3

33. [Problem Solving 3] *

A bowl of M&Ms is on a table. Sam takes away half of the M&Ms. Nick then takes one third of what is left. Eight or half of the remainder are red M&Ms. How many M&Ms were there originally?

48



Name:

Due Date: / /

Parent's Signature:

QUOTE OF THE WEEK
Patience - The companion of wisdom.
St. Augustine

1. [+ Whole Numbers to 10]

	10	6	5	8	12	9	11	7	3	14
+ 8	18	14	13	16	20	17	19	15	11	22

2. [- Whole Numbers to 10]

	14	11	17	16	23	10	12	29	18	15
- 10	4	1	7	6	13	0	2	19	8	5

3. [× Whole Numbers to 12]

	4	6	12	10	7	3	11	8	9	5
× 7	28	42	84	70	49	21	77	56	63	35

4. [÷ Whole Numbers to 12]

	54	45	90	108	72	27	63	99	36	81
÷ 9	6	5	10	12	8	3	7	11	4	9

5. [Large Number +,-] *

$$5173 - 1628 = \boxed{3545}$$

6. [Large Number ×,÷] *

$$7344 \div 9 = \boxed{816}$$

7. [Decimal +,-] *

$$5.9 + 76.9 = \boxed{82.8}$$

8. [Decimal ×,÷] *

$$548.7 \div 1000 = \boxed{0.5487}$$

9. [Fraction +,-] *

$$4 - 2\frac{7}{11} = \boxed{1\frac{4}{11}}$$

10. [Fraction ×,÷] *

$$6 \div \frac{3}{5} = \boxed{10}$$

11. [Percentages] *

$$8\% \text{ of } 50 = \boxed{4}$$

12. [Decimals / Fractions / Percents]

Complete the equivalent fractions:

$$\frac{5}{6} = \frac{\boxed{25}}{\boxed{30}} = \frac{75}{\boxed{90}}$$

13. [Integers] *

From a cruising depth of 75 m below sea level (BSL) the Nautilus descended to 105 m BSL and then rose to 80 m BSL. What is the total vertical distance the Nautilus travelled? $\boxed{55 \text{ m}}$

14. [Rates / Ratios] *

A red kangaroo jumps along at 40 km/h. At this rate how long would it take to jump 2 km? $\boxed{3 \text{ min}}$

15. [Indices / Square Roots]

$$\sqrt{121} = \boxed{11}$$

16. [Order of Operations] *

$$90 \div (9 + 6) \times 3 = \boxed{18}$$

17. [Exploring Numbers]

Write the number 605 000 in words.

$\boxed{\text{six hundred and five thousand}}$

18. [Multiples / Factors / Primes] *

What is the highest common factor (HCF) of 18 and 45? $\boxed{9}$

19. [Number Patterns]

Complete the pattern: 97.2, 32.4, 10.8, 3.6,

$\boxed{1.2, 0.4}$

20. [Expressions]

Write as an expression: A number that is equal to 36 more than y

$\boxed{y + 36}$

21. [Substitution] *

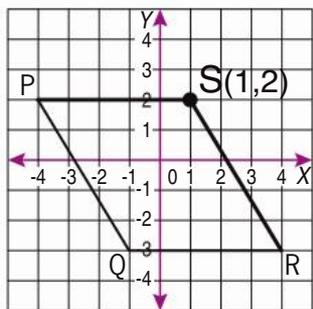
If $a = 0$ and $b = 8$, find the value of $7ab$ $\boxed{0}$

22. [Equations] *

$$\frac{4}{7} \times \boxed{28} = 16$$

23. [Coordinates]

What are the coordinates of point S that will make PQRS a parallelogram?



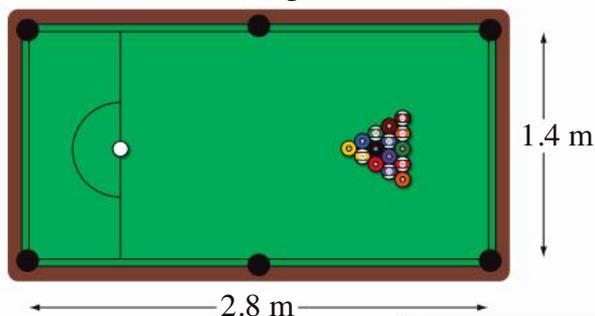
(1, 2)

24. [Units of Measurement / Time] *

350 cm = 3.5 m

25. [Perimeter] *

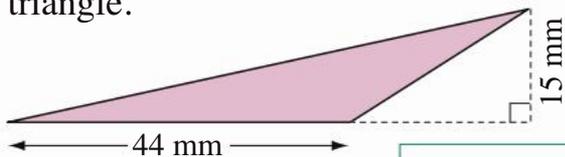
What is the perimeter of the playing surface of a rectangular billiard table?



8.4 m

26. [Area / Volume] *

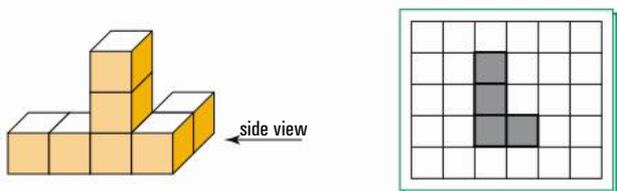
Find the area of the obtuse-angled triangle.



330 mm²

27. [Shapes]

Draw the side view of this solid.



28. [Location / Transformation]

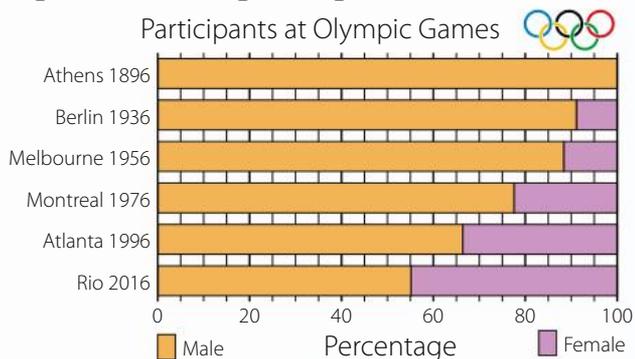
This compass shows that you are facing northeast. How many degrees clockwise must you turn to face northwest?



270°

29. [Statistics]

In which of the Olympic games shown did females make up closest to one quarter of the participants?



Montreal 1976

30. [Probability] *

When the spinner is spun once, what is the probability of spinning a prime number? [Give your answer as a fraction in simplest form.]

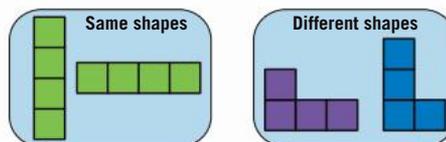


2/5

31. [Problem Solving 1] *

The computer game *Tetris* involves shapes made of four squares. Each square must share at least one side with another square. How many different configurations are there in the game?

[Note: See diagrams below. If one shape can be rotated to match another shape, then the shapes are not different.]



7

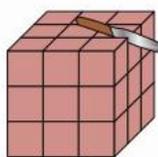
32. [Problem Solving 2] *

At a party there were twenty-three students. Deena danced with six boys, Chloe with seven, Moira with eight and so on for all the girls up to the last girl Anna, who danced with all the boys. How many boys were at the party?

14

33. [Problem Solving 3] *

A solid cube is painted on all 6 faces, and then it is sliced into 27 smaller cubes. How many of these smaller cubes are painted on only one face?



6



Name:

Due Date: / /

Parent's Signature:

QUOTE OF THE WEEK

I like work; it fascinates me. I can sit and look at it for hours.
Jerome K. Jerome

1. [+ Whole Numbers to 10]

	10	13	9	21	14	18	2	17	15	26
+ 4	14	17	13	25	18	22	6	21	19	30

2. [- Whole Numbers to 10]

	16	29	10	23	17	11	24	25	22	18
- 9	7	20	1	14	8	2	15	16	13	9

3. [× Whole Numbers to 12]

	11	4	9	5	12	7	8	10	3	6
× 12	132	48	108	60	144	84	96	120	36	72

4. [+ Whole Numbers to 12]

	24	66	48	72	30	42	54	18	60	36
÷ 6	4	11	8	12	5	7	9	3	10	6

5. [Large Number +, -] *

$$2530 + 691 = \boxed{3221}$$

6. [Large Number ×, ÷] *

$$43 \times 7 = \boxed{301}$$

7. [Decimal +, -] *

$$30.4 - 18.5 = \boxed{11.9}$$

8. [Decimal ×, ÷] *

$$0.7 \times 0.6 = \boxed{0.42}$$

9. [Fraction +, -] *

$$\frac{8}{15} + \frac{2}{15} = \boxed{\frac{2}{3}}$$

10. [Fraction ×, ÷]

$$\frac{3}{5} \times \frac{1}{2} = \boxed{\frac{3}{10}}$$

11. [Percentages] *

If a \$40 book is reduced by 25%, what is the sale price? $\boxed{\$ 30}$

12. [Decimals / Fractions / Percents]

Of all the tourist arrivals worldwide, 11% are destined for France. Write this percentage as a decimal. $\boxed{0.11}$

13. [Integers] *

Confucius was born in 551 BC and died 72 years later. What year was that? $\boxed{479 \text{ BC}}$

14. [Rates / Ratios]

Simplify the ratio 18 : 30 : 72 $\boxed{3 : 5 : 12}$

15. [Indices / Square Roots]

$$60^2 = \boxed{3600}$$

16. [Order of Operations] *

$$(5 + 9) \div (15 - 8) = \boxed{2}$$

17. [Exploring Numbers]

Round 4826 to the nearest hundred. $\boxed{4800}$

18. [Multiples / Factors / Primes]

What is the next prime number after 80? $\boxed{83}$

19. [Number Patterns]

Complete the pattern: 0, 1, 4, 5, 8, $\boxed{9, 12}$

20. [Expressions]

Choose the like terms: z, 2a, 3z $\boxed{z, 3z}$

21. [Substitution] *

If $h = 7$ and $i = 3$, find the value of $2h + 2i$ $\boxed{20}$

22. [Equations] *

$$3 \times \boxed{8} - 10 = 14$$

23. [Coordinates]

Complete the table for this rule:

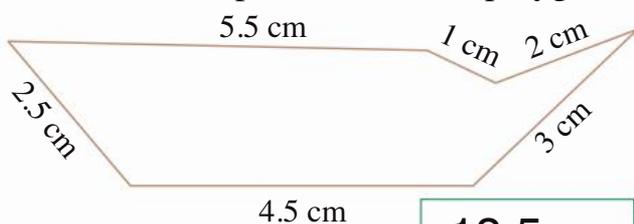
No. of hours (x)	Distance travelled in km (90x)
1	$90 \times 1 = 90$
2	$90 \times 2 = 180$
3	$90 \times 3 = 270$
4	$90 \times 4 = 360$
5	$90 \times 5 = 450$
6	$90 \times 6 = 540$

24. [Units of Measurement / Time] *

1.5 L = **1500** mL

25. [Perimeter] *

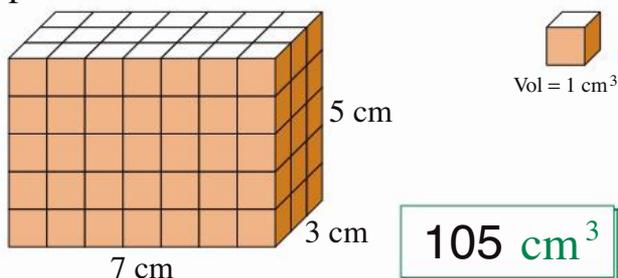
Calculate the perimeter of the polygon.



18.5 cm

26. [Area / Volume] *

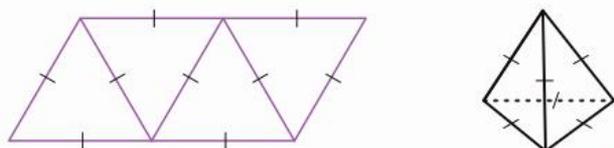
Using Volume = length \times width \times height, find the volume of the rectangular prism.



105 cm³

27. [Shapes]

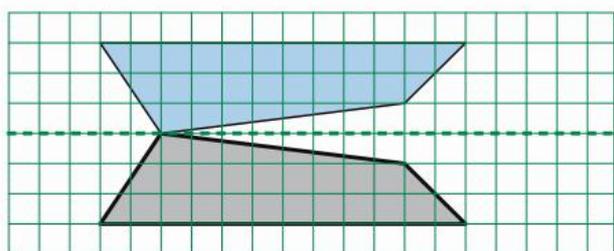
What three-dimensional shape can this net be used to make?



regular tetrahedron

28. [Location / Transformation]

Redraw this shape after reflecting it in the horizontal dotted line.



29. [Statistics] *

This table shows the number of countries in each of the world's regions. Find the median of the data.

World's regions	Countries
North America	3
South America	12
Australia/Oceania	15
Central America/Caribbean	20
Middle East/North Africa	23
Asia	27
Africa	47
Europe	48

21.5

30. [Probability] *

A box of shaped biscuits contains 15 squares, 17 triangles, 6 rectangles, 4 diamonds and 8 hexagons. If a biscuit is chosen at random, what is the probability of choosing a square one? [Give your answer as a fraction in simplest form.]

$\frac{3}{10}$

31. [Problem Solving 1] *

Nine lollies cost less than \$10, while ten lollies cost more than \$11. How much does each lolly cost?

\$ 1.11

32. [Problem Solving 2] *

Alex was counting his coins by 2s. Because one coin was left over, he counted them by 3s. Again there was one left over so he counted by 4s, then 5s, then 6s and finally by 7s. Each time there was one left over. Knowing that Alex did not have more than 800 coins, exactly how many coins did he have?

421

33. [Problem Solving 3] *

Pierre de Fermat, a 17th century French lawyer, stated that any whole number can be written as the sum of four or less square numbers.

For example: $15 = 3^2 + 2^2 + 1^2 + 1^2$

Express 61 as such a sum.

[or $7^2 + 2^2 + 2^2 + 2^2$
or $5^2 + 4^2 + 4^2 + 2^2$
or $6^2 + 5^2$]

$61 = 6^2 + 4^2 + 3^2$



Name:

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QUOTE OF THE WEEK

He who would leap high must take a long run.
Danish Proverb

1. [+ Whole Numbers to 10]

	15	18	3	9	24	22	10	16	11	7
+ 6	21	24	9	15	30	28	16	22	17	13

2. [- Whole Numbers to 10]

	11	17	15	12	29	48	14	16	10	23
- 8	3	9	7	4	21	40	6	8	2	15

3. [× Whole Numbers to 12]

	10	11	7	3	12	6	8	4	9	5
× 9	90	99	63	27	108	54	72	36	81	45

4. [÷ Whole Numbers to 12]

	96	132	48	144	84	36	72	120	60	108
÷ 12	8	11	4	12	7	3	6	10	5	9

5. [Large Number +, -] *

$$2453 + 389 = \boxed{2842}$$

12. [Decimals / Fractions / Percents]

Write 0.09 as a percentage.

$$\boxed{9\%}$$

18. [Multiples / Factors / Primes]

List all the prime numbers between 50 and 60.

$$\boxed{53, 59}$$

6. [Large Number ×, ÷] *

$$162 \times 9 = \boxed{1458}$$

13. [Integers] *

Roman civilisation began in 509 BC and ended 985 years later. What year did it end?

$$\boxed{476 \text{ AD}}$$

19. [Number Patterns]

Complete the pattern:

1, 5, 13, 25, 41, $\boxed{61, 85}$

7. [Decimal +, -] *

$$27.3 - 9.6 = \boxed{17.7}$$

8. [Decimal ×, ÷] *

$$1.4 \times 0.8 = \boxed{1.12}$$

14. [Rates / Ratios]

Simplify the ratio

$$10 : 30 : 45 \quad \boxed{2 : 6 : 9}$$

20. [Expressions]

Choose the like terms:

$g, 2g, 2h$ $\boxed{g, 2g}$

9. [Fraction +, -] *

$$\frac{9}{10} - \frac{7}{10} = \boxed{\frac{1}{5}}$$

15. [Indices / Square Roots]

$$50^2 = \boxed{2500}$$

10. [Fraction ×, ÷]

$$\frac{1}{3} \times \frac{5}{8} = \boxed{\frac{5}{24}}$$

16. [Order of Operations] *

$$(8 + 4 \times 7) \div 18 = \boxed{2}$$

21. [Substitution] *

If $c = 3$ and $d = 2$, find the value of $-2c - 8d$

$$\boxed{-22}$$

11. [Percentages] *

In a store a \$70 bag is marked '30% off'. What is the sale price of the bag?

$$\boxed{\$ 49}$$

17. [Exploring Numbers]

Round 908 to the nearest ten.

$$\boxed{910}$$

22. [Equations] *

$$40 - 3 \times \boxed{5} = 25$$

23. [Coordinates]

Complete the table of values for the linear rule $y = 10 - x$

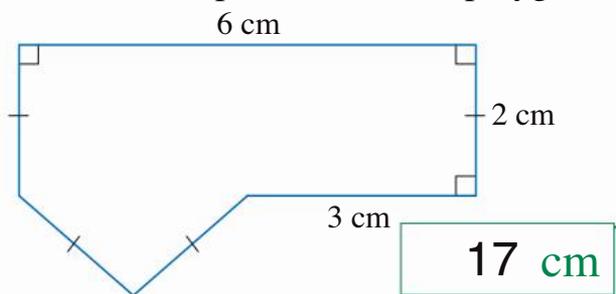
x	$y = 10 - x$	y
5	$y = 10 - 5 = 5$	5
6	$y = 10 - 6 = 4$	4
7	$y = 10 - 7 = 3$	3
8	$y = 10 - 8 = 2$	2
9	$y = 10 - 9 = 1$	1
10	$y = 10 - 10 = 0$	0

24. [Units of Measurement / Time] *

600 mL = 0.6 L

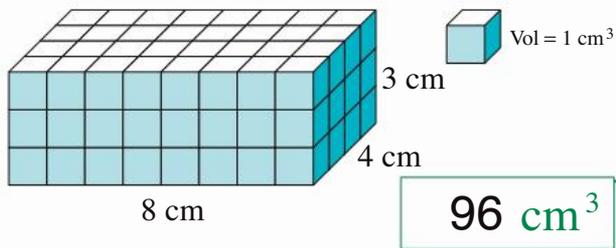
25. [Perimeter] *

Calculate the perimeter of the polygon.



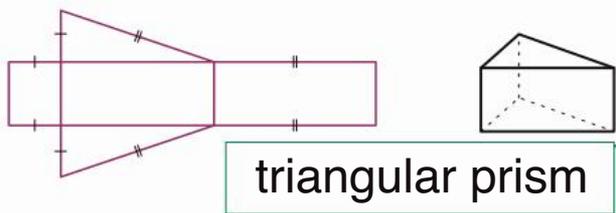
26. [Area / Volume] *

Using $V = lwh$ find the volume of the rectangular prism.



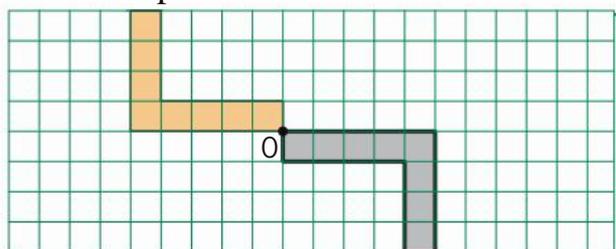
27. [Shapes]

What three-dimensional shape can this net be used to make?



28. [Location / Transformation]

Redraw this shape after rotating it 180° about the point O.



29. [Statistics] *

This table shows the number of storeys of the ten tallest buildings in Melbourne (2020 data). Find the median and mode of the data.

Melbourne - Tallest Buildings (Number of Storeys)									
63	63	68	69	70	72	78	84	91	100

median = 71 mode = 63

30. [Probability]

A modern piano has 52 white keys and 36 black keys. What is the probability of pressing a white key? [Give your answer as a fraction in simplest form.]



$\frac{13}{22}$

31. [Problem Solving 1] *

Move just one match to make this equation correct.



$4 = 1 + 5$

32. [Problem Solving 2]

Complete the multiplication table.

×	4	7	5	9
3	12	21	15	27
5	20	35	25	45
6	24	42	30	54
7	28	49	35	63

33. [Problem Solving 3] *

Andrea, Belinda and Chloe spent the evening with their husbands. Eugene was seen with his wife dining at *Stake Out* but they were not the couple that went off in a limousine. Belinda went to see *Rainbo IV* but not with David. Andrea and her husband travelled by taxi and it was neither Flavian nor Eugene who was seen with his wife on a tandem bike. Who was it then who had a fun night at the *Water World* fun park, and how did they get there?

Chloe & David on a tandem bike



Name:

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QUOTE OF THE WEEK

Believe nothing of what you hear, and only half of what you see.
Proverb

1. [+ Whole Numbers to 10]

	5	22	9	31	10	4	16	13	19	17
+ 7	12	29	16	38	17	11	23	20	26	24

2. [- Whole Numbers to 10]

	26	13	10	5	8	22	27	9	21	24
- 4	22	9	6	1	4	18	23	5	17	20

3. [× Whole Numbers to 12]

	8	3	11	6	7	9	10	12	4	5
× 11	88	33	121	66	77	99	110	132	44	55

4. [+ Whole Numbers to 12]

	15	55	35	50	60	30	45	40	20	25
÷ 5	3	11	7	10	12	6	9	8	4	5

5. [Large Number +, -] *

$$4283 + 2976 = \boxed{7259}$$

12. [Decimals / Fractions / Percents]

Write 0.6 as a percentage. $\boxed{60\%}$

17. [Exploring Numbers]

Round 23 509 to the nearest thousand.

$$\boxed{24\ 000}$$

6. [Large Number ×, ÷] *

$$5034 \times 6 = \boxed{30\ 204}$$

13. [Integers] *

Oxygen melts at -218°C . Heat it a further 35°C , and it boils. At what temperature does oxygen boil?

18. [Multiples / Factors / Primes]

List the first 3 odd composite numbers.

$$\boxed{9, 15, 21}$$

7. [Decimal +, -] *

$$8.02 - 0.08 = \boxed{7.94}$$

$$\boxed{-183^{\circ}\text{C}}$$

8. [Decimal ×, ÷] *

$$2.5 \times 0.9 = \boxed{2.25}$$

19. [Number Patterns]

Complete the pattern:

26, 25, 20, 19, 14, $\boxed{13, 8}$

9. [Fraction +, -] *

$$\frac{7}{8} - \frac{3}{8} = \boxed{\frac{1}{2}}$$

14. [Rates / Ratios]

Simplify the ratio $42 : 28 : 21$ $\boxed{6 : 4 : 3}$

20. [Expressions]

Choose the like terms:

$vw, 3, w, 3vw$
 $\boxed{vw, 3vw}$

10. [Fraction ×, ÷]

$$\frac{4}{5} \times \frac{2}{3} = \boxed{\frac{8}{15}}$$

15. [Indices / Square Roots]

$$70^2 = \boxed{4900}$$

21. [Substitution] *

If $d = 5$ and $e = 3$, find the value of $4de - 3e$ $\boxed{51}$

11. [Percentages] *

In a store a \$75 shirt is labelled 'Save 40%'. What is the sale price of the shirt?

$$\boxed{\$ 45}$$

16. [Order of Operations] *

$$17 - (9 - 12 \div 3) = \boxed{12}$$

22. [Equations] *

$$12 + 20 \times \boxed{3} = 72$$

23. [Coordinates]

Complete the table of values for the linear function $y = 5x$

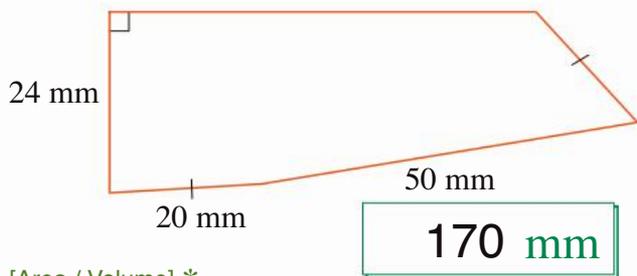
x	$y = 5x$	y
0	$y = 5 \times 0 = 0$	0
1	$y = 5 \times 1 = 5$	5
2	$y = 5 \times 2 = 10$	10
3	$y = 5 \times 3 = 15$	15
4	$y = 5 \times 4 = 20$	20
5	$y = 5 \times 5 = 25$	25

24. [Units of Measurement / Time] *

10 500 mL = **10.5** L

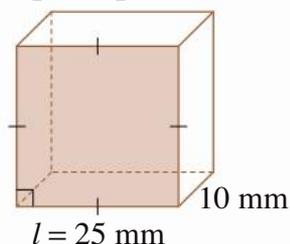
25. [Perimeter] *

Calculate the perimeter of the polygon.



26. [Area / Volume] *

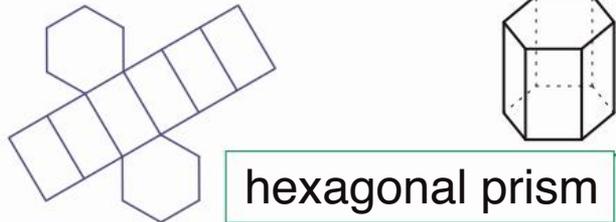
Using $V = l^2h$ find the volume of the square prism.



6250 mm³

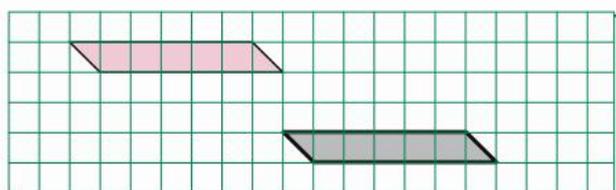
27. [Shapes]

What three-dimensional shape can this net be used to make?



28. [Location / Transformation]

Redraw this parallelogram after translating it 7 units right and 3 units down.



29. [Statistics] *

This table shows the number of ski runs at selected resorts in Colorado. Find the mean (average) and range of the data.

Resorts in Colorado - ski runs					
5	15	54	85	90	105

mean = 59 range = 100

30. [Probability] *

Jane randomly looks inside a 24-page magazine. Find the probability of looking at a page that is a prime number. [Give your answer as a fraction in simplest form.]

$\frac{3}{8}$

31. [Problem Solving 1] *

Which of the numbers 4, 5, 6, 7 or 8, when placed as a denominator in the fraction $\frac{17}{?}$, gives a result closest to $2\frac{1}{2}$?

$\frac{17}{7}$

32. [Problem Solving 2] *

Cross out the fewest numbers in this list so that none of the numbers that are left are twice the value of any other number in the list.

- 1 ~~X~~ 3 4 5 ~~6~~ 7 ~~X~~
 9 ~~X~~ 11 12 13 ~~14~~ 15 16
 17 ~~X~~ 19 20 21 ~~22~~ 23 ~~X~~

How many numbers must you cross out?

8

Other combinations of 8 are possible.

33. [Problem Solving 3] *

The number 75 can be expressed as the sum of two or more consecutive positive integers in five different ways. One such sequence begins with 13: $13 + 14 + 15 + 16 + 17 = 75$. With what number does each of the other four sequences begin?

3, 10, 24 & 37



Name:

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QUOTE OF THE WEEK

You can't act like a skunk without someone getting wind of it.
Lorene Workman

1. [+ Whole Numbers to 10]

	12	18	9	15	6	13	17	11	20	4
+ 9	21	27	18	24	15	22	26	20	29	13

2. [- Whole Numbers to 10]

	27	11	18	23	12	24	29	16	25	10
- 5	22	6	13	18	7	19	24	11	20	5

3. [× Whole Numbers to 12]

	12	4	7	11	3	10	6	5	9	8
× 4	48	16	28	44	12	40	24	20	36	32

4. [+ Whole Numbers to 12]

	32	88	56	80	40	72	48	96	64	24
÷ 8	4	11	7	10	5	9	6	12	8	3

5. [Large Number +, -] *

$$6304 + 3296 = \boxed{9600}$$

6. [Large Number ×, ÷] *

$$2109 \times 8 = \boxed{16872}$$

7. [Decimal +, -] *

$$6.27 - 4.88 = \boxed{1.39}$$

8. [Decimal ×, ÷] *

$$1.3 \times 0.7 = \boxed{0.91}$$

9. [Fraction +, -] *

$$\frac{7}{12} + \frac{7}{12} = \boxed{1\frac{1}{6}}$$

10. [Fraction ×, ÷]

$$\frac{1}{3} \times \frac{2}{11} = \boxed{\frac{2}{33}}$$

11. [Percentages] *

In a store a \$300 camera is discounted by 15%. What is the sale price of the camera? $\boxed{\$255}$

12. [Decimals / Fractions / Percents]

The Australian population accounts for 0.3% of the world's population. Write this percentage as a decimal. $\boxed{0.003}$

13. [Integers] *

At its lowest point, the Euro tunnel is 115 m below sea level. At this point, the tunnel is 50 m below the sea bed. How deep is the ocean? $\boxed{65 \text{ m}}$

14. [Rates / Ratios]

Simplify the ratio
32 : 56 : 40 $\boxed{4 : 7 : 5}$

15. [Indices / Square Roots]

$$80^2 = \boxed{6400}$$

16. [Order of Operations] *

$$(9 - 2) \times (8 + 3) = \boxed{77}$$

17. [Exploring Numbers]

Round 16244 to the nearest hundred. $\boxed{16200}$

18. [Multiples / Factors / Primes]

Choose the composite numbers:

29, 30, 31, 32, 33, 34, 35, 36, 37

$\boxed{30, 32, 33, 34, 35, 36}$

19. [Number Patterns]

Complete the pattern:

1, 8, 27, 64, $\boxed{125, 216}$

20. [Expressions]

Choose the like terms:

2ab, 2a, 2b, ab

$\boxed{2ab, ab}$

21. [Substitution] *

If $f = 21$ and $g = -2$, find the value of

$$\frac{f-7}{g} \quad \boxed{-7}$$

22. [Equations] *

$$7 \times (15 - \boxed{12}) = 21$$

23. [Coordinates]

Complete the table of values for the linear function $y = x - 3$

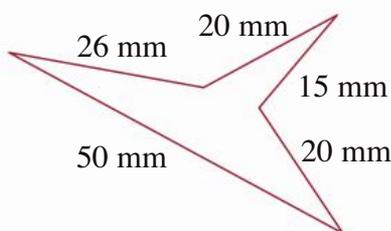
x	$y = x - 3$	y
0	$y = 0 - 3 = -3$	-3
1	$y = 1 - 3 = -2$	-2
2	$y = 2 - 3 = -1$	-1
3	$y = 3 - 3 = 0$	0
4	$y = 4 - 3 = 1$	1
5	$y = 5 - 3 = 2$	2

24. [Units of Measurement / Time] *

12.8 L = **12800** mL

25. [Perimeter] *

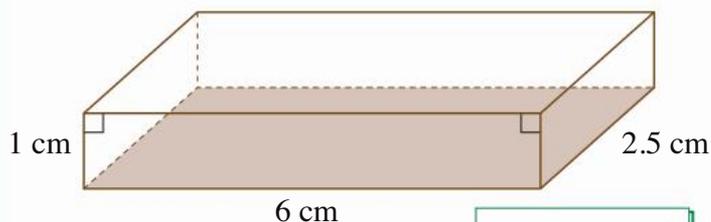
Calculate the perimeter of the polygon.



131 mm

26. [Area / Volume] *

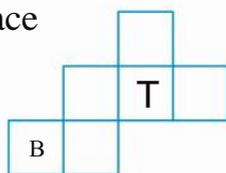
Find the volume of the rectangular prism.



15 cm³

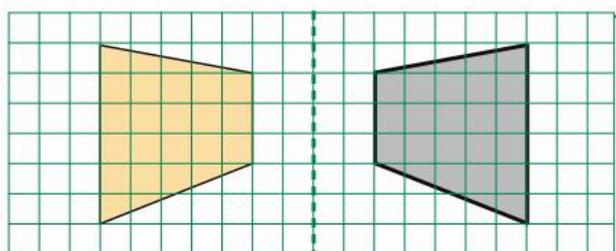
27. [Shapes]

On this net of a cube, a face is marked B. Label the opposite face with a T.



28. [Location / Transformation]

Redraw this trapezium after reflecting it in the vertical dotted line.



29. [Statistics] *

The table shows the number of calories per serving of some raw vegetables. Find the mean (average) and range of the data.

Vegetable	Calories
lettuce	4
cucumber	8
mushroom	15
zucchini	20
tomato	22
carrot	25
red capsicum	37
green peas	117

mean = 31 range = 113

30. [Probability] *

A CD player holds 5 CDs, and each disc has 12 songs. If the CDs are changed randomly, find the probability that your favourite song is played first.

[Give your answer as a fraction.]

$\frac{1}{60}$

31. [Problem Solving 1] *

Find two whole numbers whose sum is 166 and difference is 32.

99, 67

32. [Problem Solving 2] *

On Martha's 9th birthday, her mother made a cake which had the digits 0 to 9 around the edge in red icing. Using the guidelines below, her mother cut the cake into 3 pieces so that the numbers on each piece added to the same total. Mark the cuts. What fraction of the whole cake was the largest piece?



$\frac{1}{2}$

33. [Problem Solving 3] *

One day Barney caught 100 kg of fish. The total weight of the three largest fish was 35 kg and total weight of the three smallest fish was 25 kg. How many fish did Barney catch altogether?

10



Name:

Due Date: / /

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QUOTE OF THE WEEK

Always do your best. What you plant now, you will harvest later.
Og Mandino

1. [+ Whole Numbers to 10]

	2	6	13	-14	10	8	16	25	9	-17
+ 10	12	16	23	-4	20	18	26	35	19	-7

2. [- Whole Numbers to 10]

	19	-5	26	8	11	12	-10	13	17	14
- 3	16	-8	23	5	8	9	-13	10	14	11

3. [× Whole Numbers to 12]

	6	9	3	11	4	12	7	10	8	5
× 8	48	72	24	88	32	96	56	80	64	40

4. [÷ Whole Numbers to 12]

	108	63	27	90	45	81	72	99	36	54
÷ 9	12	7	3	10	5	9	8	11	4	6

5. [Large Number +, -] *

$24543 - 6078 =$

18 465

6. [Large Number ×, ÷] *

$865 \times 17 =$

14 705

7. [Decimal +, -] *

$86.14 + 5.98 =$

92.12

8. [Decimal ×, ÷] *

$1.2 \div 0.4 =$

3

9. [Fraction +, -] *

$2\frac{3}{8} + 1\frac{5}{8} =$

4

10. [Fraction ×, ÷] *

$\frac{1}{5} \div 4 =$

$\frac{1}{20}$

11. [Percentages] *

A computer is priced at \$2000. Which is the better deal?

- A) Save 30%
- B) Take \$500 off

A

12. [Decimals / Fractions / Percents]

The tongue of a chameleon is one and a half times its body length. Write this as a decimal.

1.5

13. [Integers]

$6 + (-2) =$

4

14. [Rates / Ratios] *

Which ratio is equivalent to 3 : 4?

- A) 9 : 8
- B) 18 : 24
- C) 9 : 16

B

15. [Indices / Square Roots]

$\sqrt{2500} =$

50

16. [Order of Operations] *

$(7 - 2)^2 =$

25

17. [Exploring Numbers]

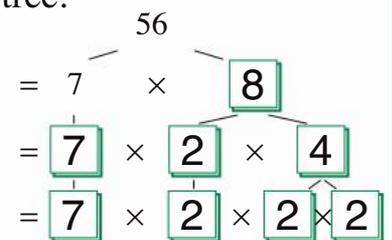
Place in order from largest to smallest:

- 0.204, 0.04, 0.24, 0.42, 0.024

0.42, 0.24, 0.204, 0.04, 0.024

18. [Multiples / Factors / Primes]

Express 56 as a product of prime numbers by completing the factor tree.



19. [Number Patterns]

Complete the pattern:

0, 0, 1, 3, 6, 10, 15

20. [Expressions]

There are x boys and y girls at the camp. How many children are at the camp altogether?

[Express your answer in terms of x and y .]

$x + y$

21. [Substitution] *

Use $d = vt$ to find the distance (d) where $v = 105$ and $t = 3$

315

22. [Equations]

$3.5 + 0.8 = 4.3$



Name:

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QUOTE OF THE WEEK
He who laughs last, didn't get the joke.

1. [+ Whole Numbers to 10]

	16	-3	7	2	14	-8	15	20	9	11
+ 2	18	-1	9	4	16	-6	17	22	11	13

2. [- Whole Numbers to 10]

	21	-4	15	12	7	-8	10	13	9	16
- 7	14	-11	8	5	0	-15	3	6	2	9

3. [× Whole Numbers to 12]

	12	7	11	4	10	3	9	8	5	6
× 10	120	70	110	40	100	30	90	80	50	60

4. [+ Whole Numbers to 12]

	12	21	30	33	15	27	18	36	24	9
÷ 3	4	7	10	11	5	9	6	12	8	3

5. [Large Number +, -] *

$$84\,000 - 3782 =$$

80218

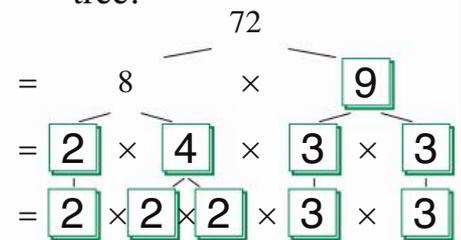
12. [Decimals / Fractions / Percents] *

Change $\frac{3}{4}$ to a decimal.

0.75

18. [Multiples / Factors / Primes]

Express 72 as a product of prime numbers by completing the factor tree.



6. [Large Number ×, ÷] *

$$243 \times 36 =$$

8748

13. [Integers]

$$-7 + 2 =$$

-5

7. [Decimal +, -] *

$$1.69 + 24.5 =$$

26.19

14. [Rates / Ratios] *

Complete the equivalent ratios:

$$20 : 15 = 4 : \underline{3}$$

19. [Number Patterns]

Complete the pattern:

80, 77, 71, 62, 50, **35, 17**

8. [Decimal ×, ÷] *

$$0.6 \div 0.3 =$$

2

9. [Fraction +, -] *

$$2\frac{7}{10} + \frac{7}{10} =$$

3 $\frac{2}{5}$

15. [Indices / Square Roots]

$$\sqrt{14\,400} =$$

120

20. [Expressions]

Enzo bought n movie tickets for \$12 each. How much did he pay in total? [Express your answer in terms of n .]

12n

10. [Fraction ×, ÷] *

$$\frac{2}{3} \div 5 =$$

$\frac{2}{15}$

16. [Order of Operations] *

$$6 + (9 - 3)^2 =$$

42

21. [Substitution] *

Use $A = l^2$ to find the area (A) of a square where $l = 10$

100

11. [Percentages] *

A car is priced at \$12000. Which is the better deal?

- A) 10% off
- B) \$1500 cash back

B

17. [Exploring Numbers] *

Which fraction has greater value?

$\frac{5}{8}$ or $\frac{3}{4}$

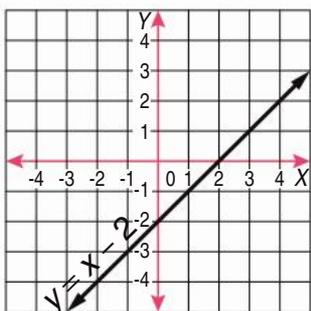
$\frac{3}{4}$

22. [Equations]

$$6.4 - \underline{1.4} = 5$$

23. [Coordinates]

Draw a line through all the points where the x -coordinate is 2 more than the y -coordinate (line of equation $y = x - 2$).

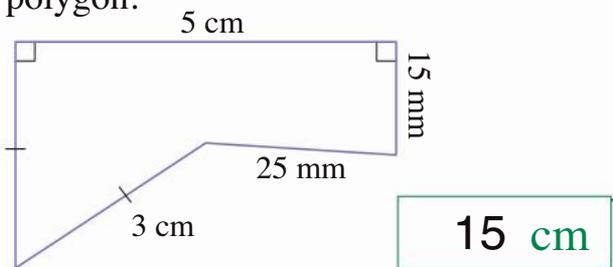


24. [Units of Measurement / Time] *

5 h = 300 min

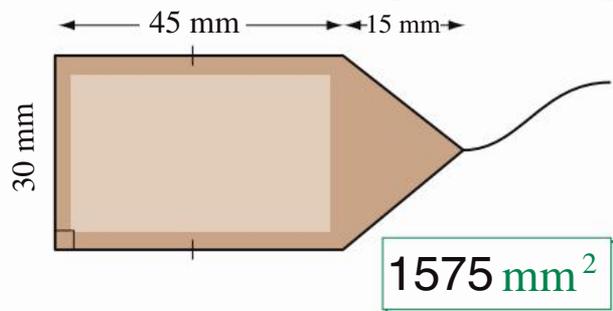
25. [Perimeter] *

Express all measurements in centimetres and then calculate the perimeter of the polygon.



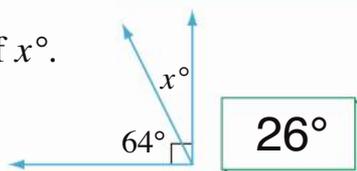
26. [Area / Volume] *

Find the area of the pentagonal name tag.



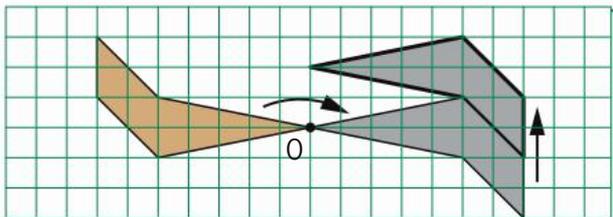
27. [Shapes] *

Find the value of x° .



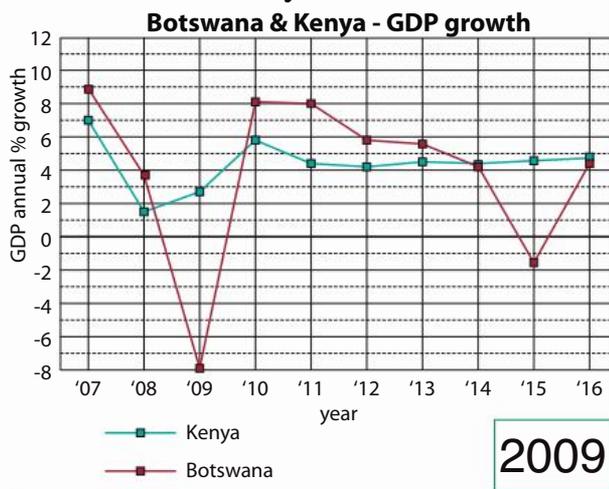
28. [Location / Transformation]

Redraw this shape after rotating it 180° about the point O and then translating it 2 units up.



29. [Statistics]

In which year was there the greatest difference in GDP growth between Botswana and Kenya?



2009

30. [Probability] *

Which event is most unlikely to happen?

- A) drawing an Ace from a deck of 52 playing cards
- B) rolling a 6 on a standard die
- C) being run over by a stampeding elephant

C

31. [Problem Solving 1] *

The base 5 number 213_5 is equivalent to:

$$\begin{aligned}
 & 2 \times 5^2 + 1 \times 5^1 + 3 \times 5^0 \\
 & = 50 + 5 + 3 \\
 & = 58 \text{ in base 10 } [5 \times 10^1 + 8 \times 10^0]
 \end{aligned}$$

What is 310_5 equal to in base 10?

80

32. [Problem Solving 2]

Use each number between 1 and 9 once to complete the equations in this square.

[In each row and column the order of operations must be followed.]

1	-	5	-	2	-6
-		×		+	
9	-	8	÷	4	7
÷		+		+	
3	+	7	+	6	16
-2		47		12	

33. [Problem Solving 3] *

The telephone numbers in a small town have two digits. They run from 00 to 99. Of the 100 possible numbers, those that become smaller when reversed are not used, i.e. 21 is not used. What is the maximum number of telephone numbers this town could have?

55



Name:

Due Date: / /

Parent's Signature:

QUOTE OF THE WEEK

Knowing is not enough; we must apply. Willing is not enough; we must do.
Goethe

1. [+ Whole Numbers to 10]

	15	-6	10	13	19	7	12	4	8	-11
+ 9	24	3	19	22	28	16	21	13	17	-2

2. [- Whole Numbers to 10]

	10	5	13	-9	22	11	14	-8	7	16
- 6	4	-1	7	-15	16	5	8	-14	1	10

3. [× Whole Numbers to 12]

	11	4	9	6	8	12	7	10	3	5
× 3	33	12	27	18	24	36	21	30	9	15

4. [+ Whole Numbers to 12]

	48	132	120	72	144	108	96	36	60	84
÷ 12	4	11	10	6	12	9	8	3	5	7

5. [Large Number +, -] *

$$76000 - 1953 =$$

74 047

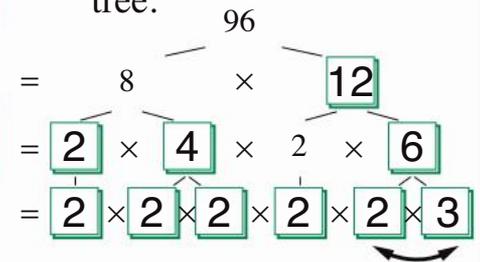
12. [Decimals / Fractions / Percents] *

Write 0.4 as a fraction in simplest form.

$\frac{2}{5}$

18. [Multiples / Factors / Primes]

Express 96 as a product of prime numbers by completing the factor tree.



6. [Large Number ×, ÷] *

$$4679 \times 12 =$$

56 148

13. [Integers]

$$-1 + 9 =$$

8

19. [Number Patterns]

Complete the pattern:

45, 33, 23, 15, 9, **5, 3**

7. [Decimal +, -] *

$$33.8 + 9 =$$

42.8

14. [Rates / Ratios] *

Complete the equivalent ratios:

$$\frac{12}{16} = \frac{3}{4}$$

8. [Decimal ×, ÷] *

$$7.5 \div 0.5 =$$

15

15. [Indices / Square Roots]

$$\sqrt{8100} =$$

90

20. [Expressions]

A plant grew 2 cm every day for d days. How much did it grow?

$2d$ cm

9. [Fraction +, -] *

$$1\frac{3}{4} + 2\frac{3}{4} =$$

$4\frac{1}{2}$

16. [Order of Operations] *

$$2 \times (20 - 9)^2 =$$

242

21. [Substitution] *

Use $A = \frac{bh}{2}$ to find the area (A) of a triangle where $b = 4$ and $h = 5$

10

10. [Fraction ×, ÷] *

$$\frac{3}{7} \div 9 =$$

$\frac{1}{21}$

17. [Exploring Numbers] *

Which fraction has greater value?

$$\frac{7}{10} \text{ or } \frac{8}{15}$$

$\frac{7}{10}$

22. [Equations]

$$5 \times 1.5 = 7.5$$

5

11. [Percentages] *

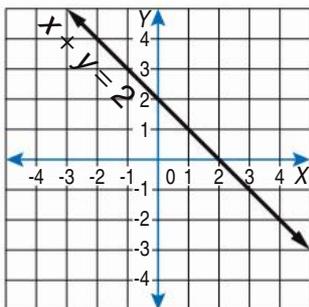
Shoes are priced at \$120. Which is the better deal?

- A) 25% discount
- B) Reduce by $\frac{1}{3}$

B

23. [Coordinates]

Draw a line through all the points where the x -coordinate and the y -coordinate add to 2 (line of equation $x + y = 2$).

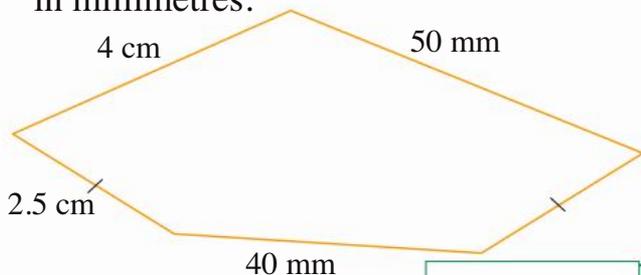


24. [Units of Measurement / Time] *

4 min 20 s = **260** s

25. [Perimeter] *

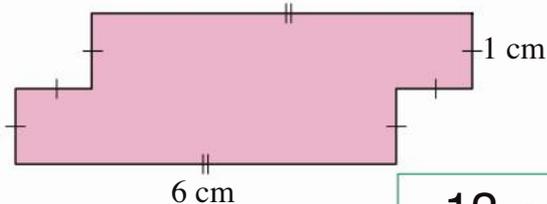
Calculate the perimeter of the polygon in millimetres.



180 mm

26. [Area / Volume] *

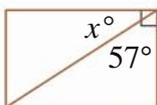
Find the area of the polygon.



12 cm²

27. [Shapes] *

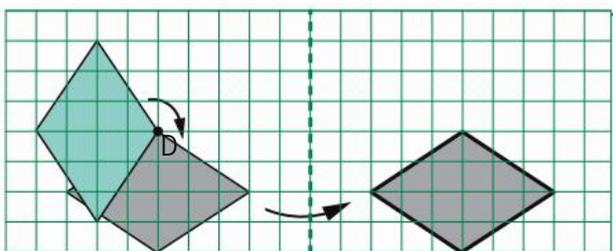
Find the value of x° .



33°

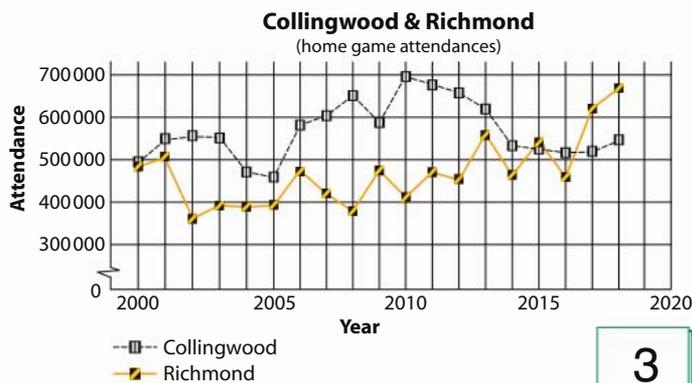
28. [Location / Transformation]

Redraw this rhombus after rotating it 90° anticlockwise about point D and then reflecting it in the vertical dotted line.



29. [Statistics]

For how many years between 2000 and 2018 was the number of people at Collingwood home games less than that of Richmond?



3

30. [Probability] *

Which has a 50% chance of success?

- A) drawing a vowel from the letters A to Z
- B) selecting an even number from the numbers 10 to 19
- C) choosing a diamond from a deck of 52 playing cards

B

31. [Problem Solving 1] *

A number of students are evenly spaced around a circle. The fourth student is directly opposite the tenth student. How many students are in the circle?

12

32. [Problem Solving 2] *

Two taps drip together at exactly 1:00 pm. One tap then drips again every 68 seconds while the other tap continues to drip every 72 seconds. At what time will the two taps both drip together again?



1:20.24 pm

33. [Problem Solving 3] *

Deduce the 3-digit secret number.

[A cow means a number is correct in value but in the wrong position. A bull indicates that a number is both correct in value and in the correct position. i.e. 2 cows and 1 bull would indicate that all three numbers were correct but two were in the wrong positions.]

Guess	Secret Number	Cows	Bulls
1st	1 6 2	.	1
2nd	1 7 5	1	1
3rd	1 6 5	1	.

572



Name:

Due Date: / /

Parent's Signature:

QUOTE OF THE WEEK

Rossiter's Transport Theory - Buses, trains and aeroplanes never run late; the timetables are simply optimistic.

1. [+ Whole Numbers to 10]

	10	-6	21	8	13	-19	2	14	7	-15
+ 8	18	2	29	16	21	-11	10	22	15	-7

2. [- Whole Numbers to 10]

	11	5	19	6	-10	3	18	7	-12	14
- 5	6	0	14	1	-15	-2	13	2	-17	9

3. [× Whole Numbers to 12]

	8	11	7	3	5	10	6	4	12	9
× 6	48	66	42	18	30	60	36	24	72	54

4. [+ Whole Numbers to 12]

	35	56	77	63	28	84	70	21	42	49
÷ 7	5	8	11	9	4	12	10	3	6	7

5. [Large Number +,-] *

$$52076 - 21897 =$$

30179

6. [Large Number ×,÷] *

$$3074 \times 28 =$$

86072

7. [Decimal +,-] *

$$49.96 + 17.84 =$$

67.8

8. [Decimal ×,+] *

$$5.8 \div 0.2 =$$

29

9. [Fraction +,-] *

$$2\frac{5}{6} + 1\frac{5}{6} =$$

4\frac{2}{3}

10. [Fraction ×,+] *

$$\frac{4}{7} \div 2 =$$

\frac{2}{7}

11. [Percentages] *

A gold ring costs \$320. Which is the better deal?

A) Save 15%

B) Reduce by $\frac{1}{4}$

B

12. [Decimals / Fractions / Percents] *

Write 0.08 as a fraction in simplest form.

\frac{2}{25}

13. [Integers]

$$-5 + (-1) =$$

-6

14. [Rates / Ratios] *

Complete the equivalent ratios:

$$\frac{7}{10} = \frac{63}{90}$$

15. [Indices / Square Roots]

$$\sqrt{12100} =$$

110

16. [Order of Operations] *

$$(13 - 3)^2 \div 5 =$$

20

17. [Exploring Numbers] *

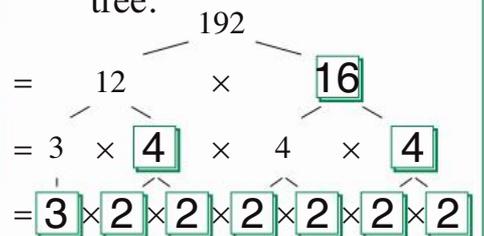
Place in order from smallest to largest:

$$\frac{3}{4}, \frac{2}{5}, \frac{2}{3}$$

\frac{2}{5}, \frac{2}{3}, \frac{3}{4}

18. [Multiples / Factors / Primes]

Express 192 as a product of prime numbers by completing the factor tree.



19. [Number Patterns]

Complete the pattern:

$$36, 25, 16, 9, \underline{4}, \underline{1}$$

20. [Expressions]

The canteen had s sausages and sold 25 at lunchtime. How many sausages were left?

$s - 25$

21. [Substitution] *

Use $P = 2(l + w)$ to find the perimeter (P) of a rectangle where $l = 7$ and $w = 4$

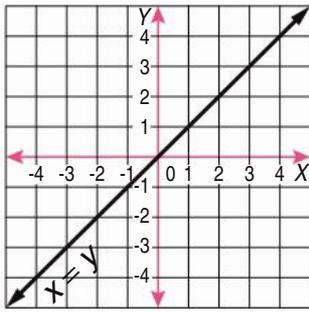
22

22. [Equations]

$$1.2 \times \underline{4} = 4.8$$

23. [Coordinates]

Draw a line through all the points where the x -coordinate is equal to the y -coordinate (line of equation $y = x$).

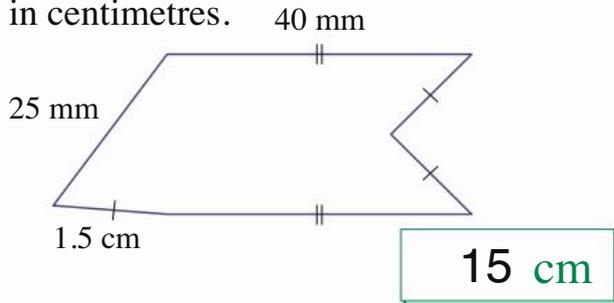


24. [Units of Measurement / Time] *

$1\frac{1}{3}$ h = **80** min

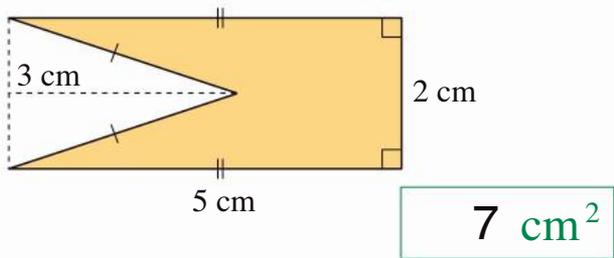
25. [Perimeter] *

Calculate the perimeter of the polygon in centimetres.



26. [Area / Volume] *

Find the area of the polygon.



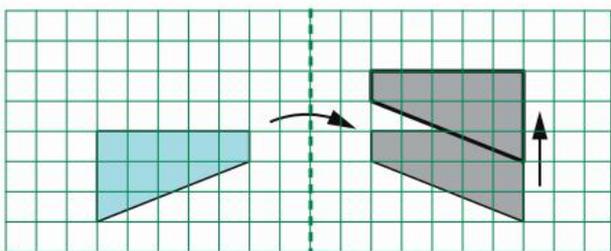
27. [Shapes] *

Find the value of x° .



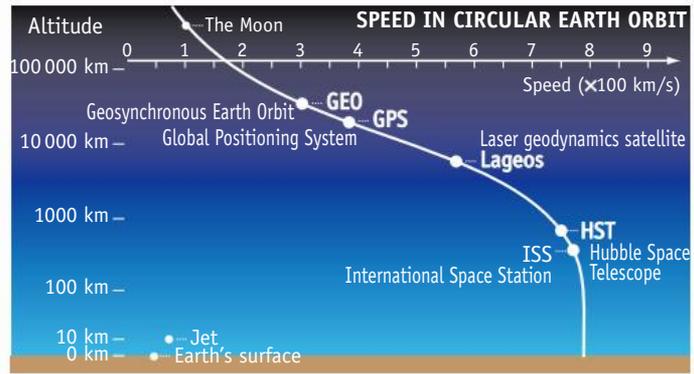
28. [Location / Transformation]

Redraw this trapezium after reflecting it in the vertical dotted line and then translating it 2 units up.



29. [Statistics]

Which space object orbits the earth at 750 km/s?



Hubble Space Telescope

30. [Probability] *

Which event is most likely to happen?

- A) selecting a vowel from the word RADIATION
- B) tossing 'heads' on a flipped coin
- C) picking a blue ticket from a hat containing 8 red and 5 blue tickets

A

31. [Problem Solving 1] *

How many different rectangles can you make using 12 toothpicks?

[All 12 toothpicks must be used each time.]



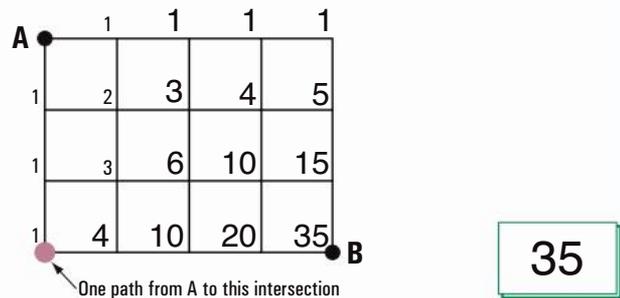
32. [Problem Solving 2] *

Mrs Nicholas is buying Christmas presents for her five children to give to one another. If each child gives a present to each of the others, how many presents must she buy?

20

33. [Problem Solving 3] *

You are to go from A to B, always moving right or down along the lines. On how many different paths can you go? [The number of paths from A to various intersections has been included.]





Name:

Due Date: / /

Parent's Signature:

QUOTE OF THE WEEK

Constant dripping will wear down a stone far more than the most violent storm.
P. K. Shaw

1. [+ Whole Numbers to 10]

	8	-2	16	1	10	-13	25	24	-7	9
+ 4	12	2	20	5	14	-9	29	28	-3	13

2. [- Whole Numbers to 10]

	10	22	5	9	26	13	24	17	-1	18
- 8	2	14	-3	1	18	5	16	9	-9	10

3. [× Whole Numbers to 12]

	7	3	8	5	4	2	6	10	9	11
× 9	63	27	72	45	36	18	54	90	81	99

4. [+ Whole Numbers to 12]

	20	40	25	50	15	35	5	45	60	30
÷ 5	4	8	5	10	3	7	1	9	12	6

5. [Large Number +, -] *

$$28790 + 5360 =$$

34 150

12. [Decimals / Fractions / Percents] *

Change $\frac{7}{10}$ to a percentage.

70%

18. [Multiples / Factors / Primes] *

Express 45 as a product of its prime factors.

$45 = 3 \times 3 \times 5$

6. [Large Number ×, ÷] *

$$6550 \div 50 =$$

131

13. [Integers]

$$4 - (-6) =$$

10

19. [Number Patterns]

Complete the pattern:

17, 12, 7, 2,

-3, -8

7. [Decimal +, -] *

$$86.14 - 5.98 =$$

80.16

14. [Rates / Ratios] *

Which is cheaper per issue?

- A) \$63 for an 18-issue subscription
- B) \$72 for a 24-issue subscription

B

20. [Expressions]

Simplify $h + i + i$

$h + 2i$

8. [Decimal ×, ÷] *

$$0.08 \times 0.3 =$$

0.024

15. [Indices / Square Roots]

$$1^5 =$$

1

21. [Substitution] *

If $k = 7$, find the value of $2k^2$

98

9. [Fraction +, -] *

$$\frac{13}{10} - \frac{2}{5} =$$

$\frac{9}{10}$

16. [Order of Operations] *

$$8 \times 6 - 2 \times 4^2 =$$

16

10. [Fraction ×, ÷] *

$$\frac{3}{7} \times \frac{1}{3} =$$

$\frac{1}{7}$

17. [Exploring Numbers]

Round 4.645 to the nearest whole number.

5

22. [Equations] *

Solve for x :
 $x + 10 = 15$

$x = 5$

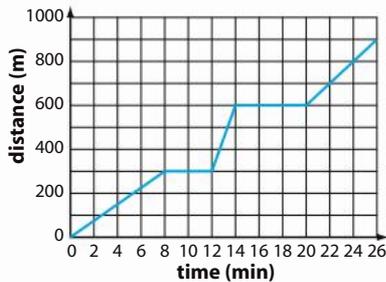
11. [Percentages] *

$$66\frac{2}{3}\% \text{ of } 240 =$$

160

23. [Coordinates]

Lucy walks to the library. How long does it take her to walk 700 metres?



22 min

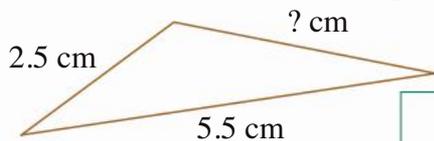
24. [Units of Measurement / Time] *

It took Leo Tolstoy six years to write *War and Peace*. How many months is this? [Leo Tolstoy - Russian author, 1828-1910]

72 months

25. [Perimeter] *

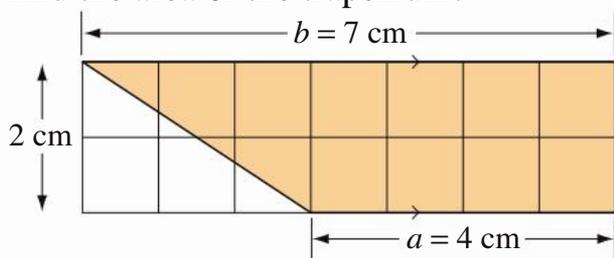
The perimeter of this scalene triangle is 11.5 cm. Find the missing side length.



3.5 cm

26. [Area / Volume] *

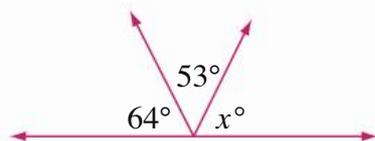
Using $\text{Area} = \frac{1}{2}(\text{base } a + \text{base } b) \times \text{height}$ find the area of the trapezium.



11 cm²

27. [Shapes] *

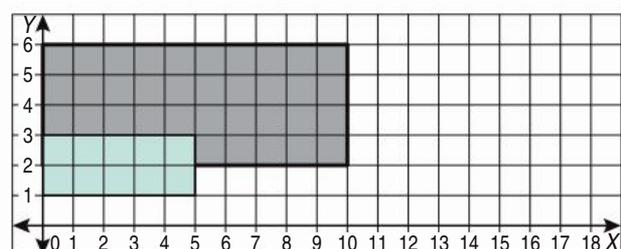
Find the value of x° .



63°

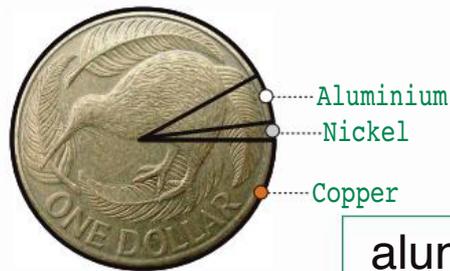
28. [Location / Transformation]

Redraw the rectangle after doubling the coordinates of its vertices.



29. [Statistics]

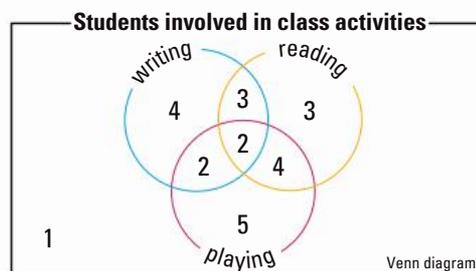
Which metal makes up 6% of the one dollar coin?



aluminium

30. [Probability] *

What is the probability that a student chosen at random does not participate in reading? [Give your answer as a fraction in simplest form.]



$\frac{1}{2}$

31. [Problem Solving 1] *

What is the smallest positive integer, greater than 2, that when divided by 3, 4 or 5 leaves a remainder of 2?

62

32. [Problem Solving 2] *

If the average of six numbers is 10, and five of them are 5, 8, 12, 15 and 17, what is the sixth number?

3

33. [Problem Solving 3] *

For an Olympic gymnastics event, the three places on the podium were occupied by Flame, June and Crystal. The silver medal winner, from New Zealand, told Flame that it was her eighteenth birthday today. The youngest medallist was the fourteen-year-old June, from China. If the bronze medal was won by the sixteen-year-old, who won gold and what country was she from?

June from China



Name:

Due Date: / /

Parent's Signature:

QUOTE OF THE WEEK

Eating is a pleasant habit which grows on you.
P. K. Shaw

1. [+ Whole Numbers to 10]

	8	11	17	-4	6	9	-15	23	10	-12
+ 5	13	16	22	1	11	14	-10	28	15	-7

2. [- Whole Numbers to 10]

	19	5	22	18	36	10	27	-11	3	14
- 4	15	1	18	14	32	6	23	-15	-1	10

3. [× Whole Numbers to 12]

	11	6	12	9	7	4	8	5	10	3
× 11	121	66	132	99	77	44	88	55	110	33

4. [+ Whole Numbers to 12]

	9	18	6	21	30	12	27	3	15	24
÷ 3	3	6	2	7	10	4	9	1	5	8

5. [Large Number +, -] *

$$56254 + 2846 =$$

59 100

12. [Decimals / Fractions / Percents] *

Change $\frac{1}{4}$ to a percentage.

25%

18. [Multiples / Factors / Primes] *

Express 16 as a product of its prime factors.

$$16 = 2 \times 2 \times 2 \times 2$$

6. [Large Number ×, ÷] *

$$10800 \div 900 =$$

12

13. [Integers]

$$3 - 9 =$$

-6

7. [Decimal +, -] *

$$24.83 - 4.97 =$$

19.86

14. [Rates / Ratios] *

Which is cheaper per song?

- A) \$12 for 15 songs
- B) \$9 for 10 songs

A

19. [Number Patterns]

Complete the pattern:

-28, -22, -16, -10,

-4, 2

8. [Decimal ×, ÷] *

$$0.7 \times 0.41 =$$

0.287

15. [Indices / Square Roots] *

$$3^3 =$$

27

20. [Expressions]

Simplify $j + j + k - k + k$

$2j + k$

9. [Fraction +, -] *

$$\frac{5}{6} - \frac{5}{12} =$$

$\frac{5}{12}$

16. [Order of Operations] *

$$(13 - 8 \div 2)^2 =$$

81

21. [Substitution] *

If $x = 4$, find the value of $2x^2 - x$

28

10. [Fraction ×, ÷] *

$$\frac{7}{8} \times \frac{2}{3} =$$

$\frac{7}{12}$

17. [Exploring Numbers]

Round 7.778 to one decimal place.

22. [Equations] *

Solve for c : $c - 12 = 3$

$c = 15$

11. [Percentages] *

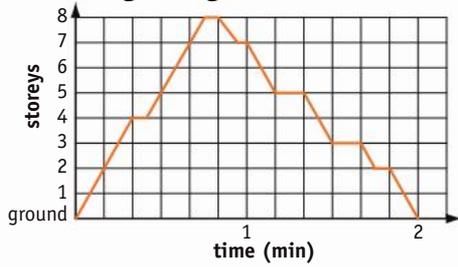
$$2\% \text{ of } 80 =$$

1.6

7.8

23. [Coordinates]

This graph shows the height of an elevator in an eight-storey building. At how many storeys does the elevator stop during the 2 minute trip, not counting the ground floor?



6

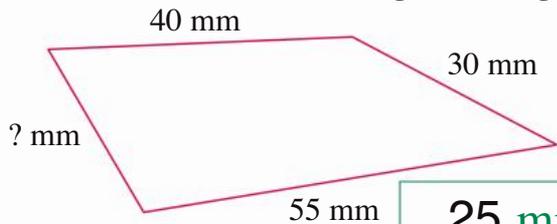
24. [Units of Measurement / Time] *

Ruppell's Griffon Vulture, the highest flying bird, can reach an altitude of 11 300 m. Express this height in kilometres.

11.3 km

25. [Perimeter] *

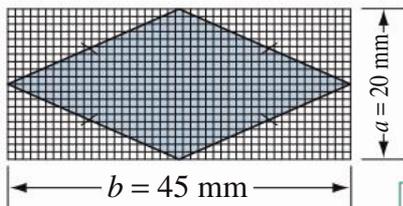
The perimeter of this quadrilateral is 150 mm. Find the missing side length.



25 mm

26. [Area / Volume] *

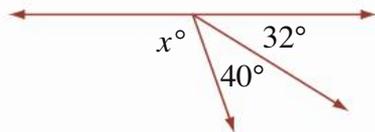
Using $\text{Area} = \frac{1}{2} \times \text{diagonal } a \times \text{diagonal } b$ find the area of the rhombus.



450 mm²

27. [Shapes] *

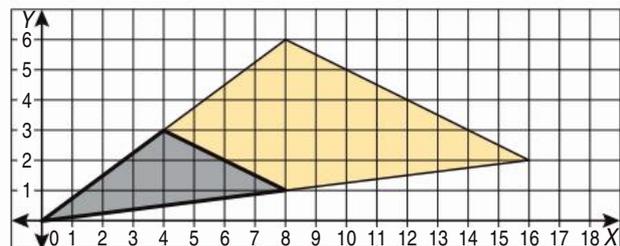
Find the value of x° .



108°

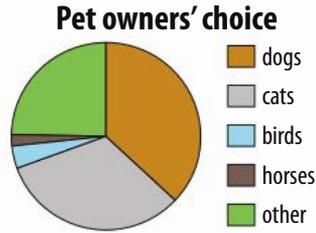
28. [Location / Transformation]

Redraw the triangle after halving the coordinates of its vertices.



29. [Statistics]

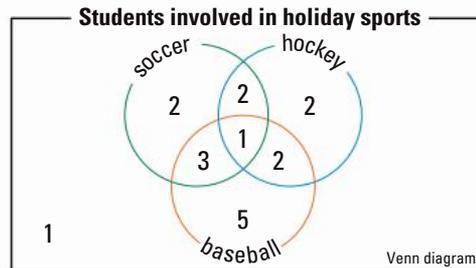
Which two animals account for 70% of all pets?



dogs & cats

30. [Probability] *

What is the probability that a student chosen at random plays baseball and soccer, but not hockey? [Give your answer as a fraction in simplest form.]



1/6

31. [Problem Solving 1] *

Use the digits 1, 3, 5 and 7, once each, to complete the multiplication. Make the largest possible answer.

$$\begin{array}{r} \boxed{7} \boxed{1} \\ \times \boxed{5} \boxed{3} \\ \hline 213 \\ 3550 \\ \hline 3763 \end{array}$$

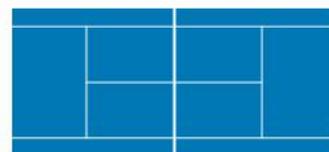
32. [Problem Solving 2] *

A solid 10 cm cube is cut into 1 cm cubes. These smaller cubes are then used to make the largest possible cube that looks solid from the outside, but is hollow inside. How many of the original 1 cm cubes are NOT used to make this larger cube?

134

33. [Problem Solving 3] *

How many rectangles are there in this diagram of a tennis court? [Hint: There are more than 20 rectangles.]



31



Name:

Due Date: / /

Parent's Signature:

QUOTE OF THE WEEK

Follow the crowd and you will never be followed by a crowd.

1. [+ Whole Numbers to 10]

	11	25	14	17	-2	8	10	23	-9	16
+ 3	14	28	17	20	1	11	13	26	-6	19

2. [- Whole Numbers to 10]

	13	28	11	27	12	-20	16	9	-4	30
- 9	4	19	2	18	3	-29	7	0	-13	21

3. [× Whole Numbers to 12]

	9	3	7	12	8	5	10	11	6	4
× 7	63	21	49	84	56	35	70	77	42	28

4. [+ Whole Numbers to 12]

	40	88	32	64	24	56	80	48	16	72
÷ 8	5	11	4	8	3	7	10	6	2	9

5. [Large Number +, -] *

$$14569 + 9518 =$$

24087

6. [Large Number ×, ÷] *

$$8160 \div 12 =$$

680

7. [Decimal +, -] *

$$8.64 - 0.9 =$$

7.74

8. [Decimal ×, ÷] *

$$0.15 \times 0.6 =$$

0.09

9. [Fraction +, -] *

$$\frac{5}{12} + \frac{1}{3} =$$

$\frac{3}{4}$

10. [Fraction ×, ÷] *

$$\frac{6}{11} \times \frac{5}{9} =$$

$\frac{10}{33}$

11. [Percentages] *

$$200\% \text{ of } 90 =$$

180

12. [Decimals / Fractions / Percents] *

In New Zealand 45% of the land cannot support agriculture. Write this percentage as a fraction in simplest form.

$\frac{9}{20}$

13. [Integers]

$$-3 - 4 =$$

-7

14. [Rates / Ratios] *

Which is the best buy?

- A) a 2 kg bag of apples at \$7.50
- B) 2 kg of loose apples at \$3.95 per kg

A

15. [Indices / Square Roots] *

$$2^6 =$$

64

16. [Order of Operations] *

$$4 \times (6 + 4) \div 2^2 =$$

10

17. [Exploring Numbers]

Round 1.4549 to two decimal places.

1.45

18. [Multiples / Factors / Primes] *

Express 44 as a product of its prime factors.

$44 = 2 \times 2 \times 11$

19. [Number Patterns]

Complete the pattern:
-44, -35, -26, -17,

-8, 1

20. [Expressions]

Simplify
 $pq + pq + mp - pq + mp$

$pq + 2mp$

21. [Substitution] *

If $m = 3$,
find the value of
 $-4m^2$

-36

22. [Equations] *

Solve for a :
 $-2 + a = 10$

$a = 12$

23. [Coordinates]

What distance is Val from school after three minutes?



400 m

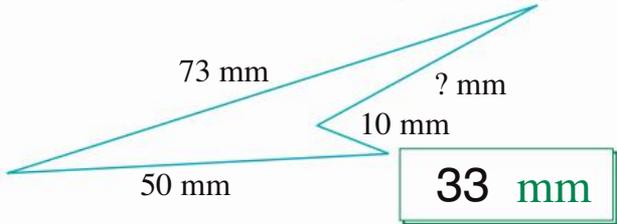
24. [Units of Measurement / Time] *

Some butterflies beat their wings at a rate of 850 beats per second. Is this more or less than 1 000 000 beats per hour?

more

25. [Perimeter] *

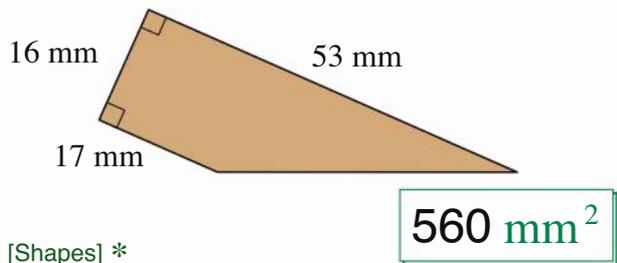
The perimeter of this quadrilateral is 166 mm. Find the missing side length.



33 mm

26. [Area / Volume] *

Using $A = \frac{1}{2}(a + b)h$ find the area of the trapezium.



560 mm²

27. [Shapes] *

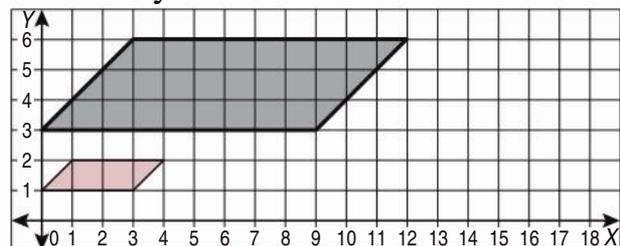
Find the value of x° .



90°

28. [Location / Transformation]

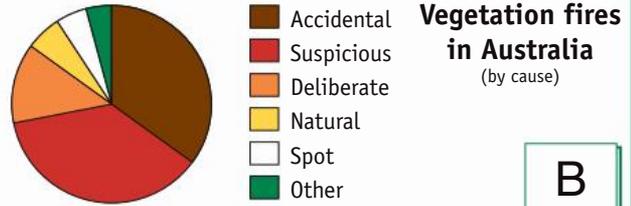
Redraw the parallelogram after multiplying the coordinates of its vertices by 3.



29. [Statistics]

Approximately what percentage of vegetation fires were deliberately lit?

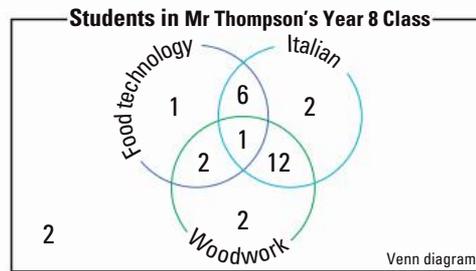
- A) 5%
- B) 15%
- C) 25%
- D) 35%



B

30. [Probability] *

What is the probability that a student chosen at random from Mr Thompson's class does only Italian and Woodwork? [Give your answer as a fraction in simplest form.]



3/7

31. [Problem Solving 1] *

A stud farm has 24 horses. One quarter are black, two thirds of the remainder are brown, and the rest are evenly divided between grey and white. How many horses are white?

3

32. [Problem Solving 2] *

A fence, 3 sections long, requires 4 posts and 6 rails, as shown. How many posts and rails are required to build a fence around a rectangular yard, which is 6 sections long and 3 sections wide?



posts = 18 rails = 36

33. [Problem Solving 3] *

A 3rd grade maths test included this rather tough challenge. Can you solve it?

If $5 * 3 = 4$ All 3 parts add to 12
 $2 * 8 = 2$ or $a * b = 12 - (a + b)$
 $5 * 1 = 6$
 and $6 * 3 = 3$ find the value of
 $1 * 7 = ?$

4



Name:

Due Date: / /

Parent's Signature:

QUOTE OF THE WEEK

Teenager to parent: "Sure I know the value of a dollar, that's why I asked for fifty."

1. [+ Whole Numbers to 10]

	13	16	22	7	24	10	-19	-8	5	21
+ 7	20	23	29	14	31	17	-12	-1	12	28

2. [- Whole Numbers to 10]

	24	7	1	16	23	-9	30	12	-28	15
- 2	22	5	-1	14	21	-11	28	10	-30	13

3. [× Whole Numbers to 12]

	8	10	4	9	6	3	11	5	7	12
× 5	40	50	20	45	30	15	55	25	35	60

4. [÷ Whole Numbers to 12]

	132	44	55	99	110	33	66	77	121	88
÷ 11	12	4	5	9	10	3	6	7	11	8

5. [Large Number +, -] *

45 672 + 2988 =

48 660

12. [Decimals / Fractions / Percents] *

In 2018, New Zealand's average internet speed increased by 16% from the previous year. Write this percentage as a fraction in simplest form.

$\frac{4}{25}$

17. [Exploring Numbers]

Round 0.0475 to three decimal places.

0.048

6. [Large Number ×, ÷] *

37 200 ÷ 15 =

2480

18. [Multiples / Factors / Primes] *

Express 120 as a product of its prime factors.

120 = 2 × 2 × 2 × 3 × 5

7. [Decimal +, -] *

97.35 - 8.6 =

88.75

13. [Integers]

-5 - (-7) =

2

19. [Number Patterns]

Complete the pattern:

-1, -9, -17, -25, -33, -41

8. [Decimal ×, ÷] *

1.03 × 0.9 =

0.927

14. [Rates / Ratios] *

Which is the best buy?

- A) a 250 g block of chocolate at \$4.50
- B) a 400 g block of chocolate at \$6.00

B

20. [Expressions]

Simplify $ab + ab - bc - ab + bc$

ab

9. [Fraction +, -] *

$\frac{1}{4} + \frac{11}{20} =$

$\frac{4}{5}$

15. [Indices / Square Roots]

$5^0 =$

1

21. [Substitution] *

If $s = 5$, find the value of $\frac{s^2 - 9}{4}$

4

10. [Fraction ×, ÷] *

$\frac{1}{12} \times \frac{2}{9} =$

$\frac{1}{54}$

16. [Order of Operations] *

$2 \times (1 + 5) \times 3^2 =$

108

22. [Equations] *

Solve for r : $18 - r = 12$

$r = 6$

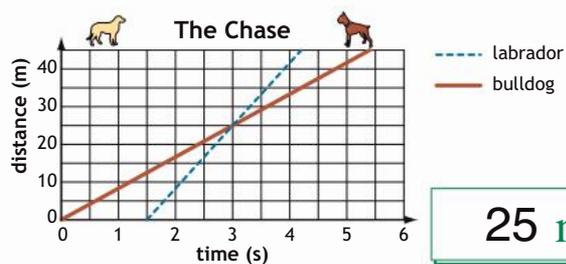
11. [Percentages] *

120% of 50 =

60

23. [Coordinates]

A labrador and a bulldog are running after a ball. After how many metres does the labrador overtake the bulldog?



25 m

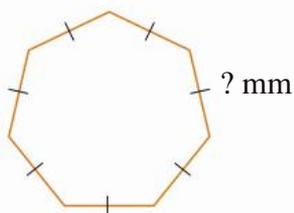
24. [Units of Measurement / Time] *

The standard golf ball has a mass of 45 g. How many golf balls are there in a bag weighing 1.8 kg?

40

25. [Perimeter] *

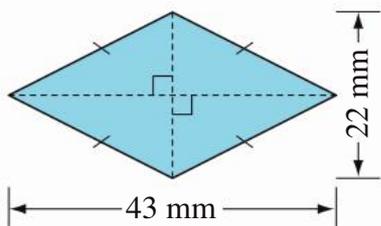
The perimeter of this regular heptagon is 84 mm. What is the length of a side?



12 mm

26. [Area / Volume] *

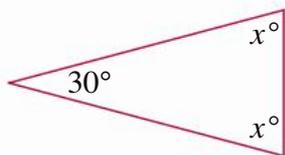
Using $A = \frac{1}{2}ab$ find the area of the rhombus.



473 mm²

27. [Shapes] *

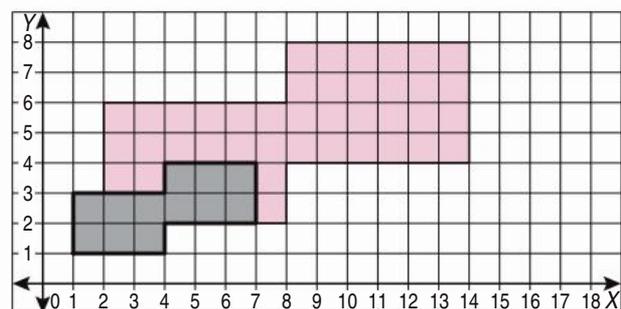
Find the value of x° .



75°

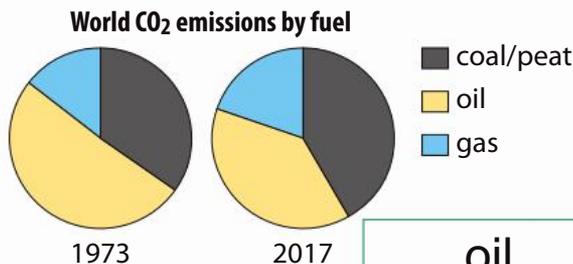
28. [Location / Transformation]

Redraw the shape after halving the coordinates of its vertices.



29. [Statistics]

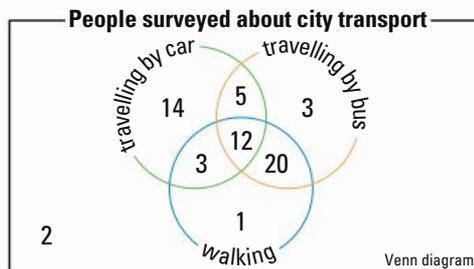
Which fuel contributed a smaller proportion of carbon dioxide (CO₂) emissions in 2017 than in 1973?



oil

30. [Probability] *

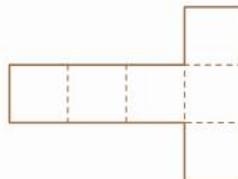
What is the probability that a person chosen at random does not travel by bus? [Give your answer as a fraction in simplest form.]



$\frac{1}{3}$

31. [Problem Solving 1] *

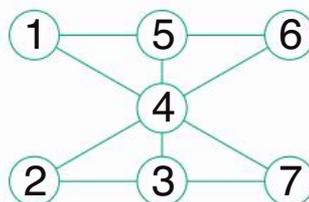
If the total area of the shape is 150 cm² and all the squares are congruent, find the perimeter of the shape.



70 cm

32. [Problem Solving 2] *

Place the numbers 1 to 7 in the circles so that the sum of each row (horizontal, vertical and diagonal) is 12.



Other solutions are possible but 4 must be in the centre.

33. [Problem Solving 3] *

A maths test has two problems. The first was solved by 70% of the students. The second was solved by 60%. Every student solved at least one of the problems. Nine students solved both problems. How many students took the test?

30



Name:

Due Date: / /

Parent's Signature:

QUOTE OF THE WEEK

The wise man knows that he knows nothing; the fool believes he knows everything.
Rossiter

1. [+ Whole Numbers to 10]

	9	-24	8	26	13	7	11	2	10	-15
+ 8	17	-16	16	34	21	15	19	10	18	-7

2. [- Whole Numbers to 10]

	14	1	25	12	-9	7	30	13	8	-26
- 6	8	-5	19	6	-15	1	24	7	2	-32

3. [× Whole Numbers to 12]

	7	11	5	3	6	-4	9	12	10	8
× 4	28	44	20	12	24	-16	36	48	40	32

4. [÷ Whole Numbers to 12]

	36	54	81	108	63	72	45	-27	9	90
÷ 9	4	6	9	12	7	8	5	-3	1	10

5. [Large Number +, -] *

$$923 + 405 + 312 =$$

1640

6. [Large Number ×, ÷] *

$$142 \times 120 =$$

17040

7. [Decimal +, -] *

$$37.85 + 5 + 0.9 =$$

43.75

8. [Decimal ×, ÷] *

$$0.06 \div 0.2 =$$

0.3

9. [Fraction +, -] *

$$\frac{4}{5} - \frac{1}{3} =$$

$\frac{7}{15}$

10. [Fraction ×, ÷] *

$$\frac{1}{9} \div \frac{4}{5} =$$

$\frac{5}{36}$

11. [Percentages] *

Write as a percentage:

5 out of 25.

20%

12. [Decimals / Fractions / Percents]

Complete the table:

Decimal	Fraction	Percent
0.03	$\frac{3}{100}$	3%

13. [Integers]

$$8 \times (-9) =$$

-72

14. [Rates / Ratios] *

Lightning reaches a temperature four times greater than the sun's surface. Find the ratio of the sun's surface temperature to lightning temperature.

1 : 4

15. [Indices / Square Roots] *

Between which two consecutive whole numbers does $\sqrt{7}$ lie?

2 and 3

16. [Order of Operations] *

$$-3 \times 4 + 2^3 \times 2 =$$

4

17. [Exploring Numbers]

Choose the whole numbers from this list:

-16, 43, $\frac{5}{7}$, -0.97, 200

43, 200

18. [Multiples / Factors / Primes] *

Express 27 as a product of its prime factors using index notation.

$27 = 3^3$

19. [Number Patterns] *

Find the 13th term in the pattern:

18, 17, 16, 15, 14, ...

6

20. [Expressions]

Simplify

$$2s + s + 4t - t$$

$3s + 3t$

21. [Substitution] *

If $j = 6$, find the value of $2(3 + j)$

18

22. [Equations] *

Solve for y:

$$3 \times y = 21$$

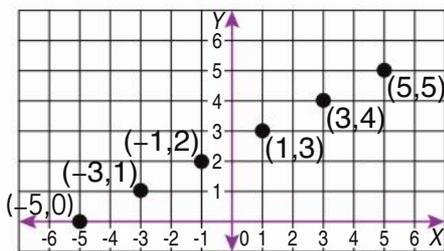
$y = 7$

23. [Coordinates]

Using the table of values, plot the points on the Cartesian plane.

[Hint: The first one has been done for you.]

x	-5	-3	-1	1	3	5
y	0	1	2	3	4	5



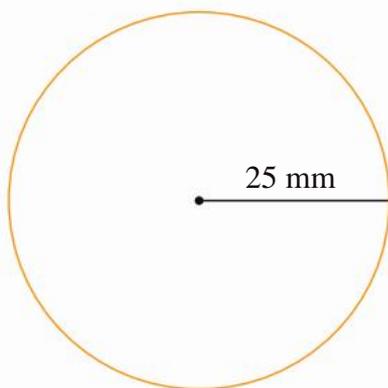
24. [Units of Measurement / Time] *

Find the time in hours and minutes between 12:20 and 23:00 the same day.

10 h 40 min

25. [Perimeter] *

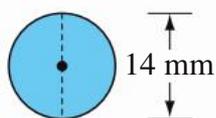
Using $C = 2\pi r$ where $\pi \approx 3.14$, calculate the circumference of the circle.



157 mm

26. [Area / Volume] *

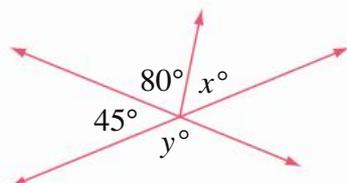
Using $A = \pi r^2$ and $\pi \approx \frac{22}{7}$, find the area of the circle.



154 mm²

27. [Shapes] *

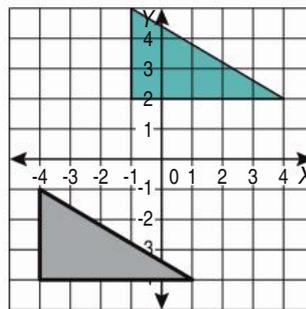
Find the values of x° and y° .



$x^\circ = 55^\circ$ $y^\circ = 135^\circ$

28. [Location / Transformation]

Redraw this triangle after subtracting 3 units from the x-coordinates and 6 units from the y-coordinates of its vertices.



29. [Statistics]

Complete the stem-and-leaf plot for the data showing the results of the men's high jump at the 1956 - 2016 Olympics: 212, 216, 218, 224, 223, 225, 236, 235, 238, 234, 239, 235, 236, 236, 238, 238

Stem	Leaf	Key
21	2 6 8	23 7 = 237 cm
22	3 4 5	
23	4 5 5 6 6 6 8 8 8 9	

30. [Probability] *

Ten balls numbered 1 to 10 are mixed together, and then one ball is drawn. Find the probability that the number drawn is not a multiple of 3.

[Give your answer as a fraction.]

$\frac{7}{10}$

31. [Problem Solving 1] *

At a convention for lawyers it was known that of the 100 present, at least one was dishonest, yet if you met any two of the lawyers, you could guarantee that at least one of the two would be honest. How many dishonest lawyers were present?

1

32. [Problem Solving 2] *

What single discount is successive discounts of 30% and 50% equivalent to?

65%

33. [Problem Solving 3] *

Students in a maths test can score 0, 1, 2 or 3 marks on each of the six questions. There is only one way to score 18 and six ways to score 17. In how many ways can a student score 16?

21



Name:

Due Date: / /

Parent's Signature:

QUOTE OF THE WEEK

Selfishness is a gift of nature. Unselfishness is an accomplishment.
Joseph Mayer

1. [+ Whole Numbers to 10]

	21	3	-10	2	19	-6	-27	14	8	15
+ 9	30	12	-1	11	28	3	-18	23	17	24

2. [- Whole Numbers to 10]

	16	-19	12	28	-7	33	10	-15	4	21
- 8	8	-27	4	20	-15	25	2	-23	-4	13

3. [× Whole Numbers to 12]

	9	5	12	6	3	10	11	8	7	-4
× 12	108	60	144	72	36	120	132	96	84	-48

4. [+ Whole Numbers to 12]

	44	24	8	40	-16	28	12	36	-32	20
÷ 4	11	6	2	10	-4	7	3	9	-8	5

5. [Large Number +, -] *

$$234 + 1409 + 56 + 138 =$$

1837

6. [Large Number ×, ÷] *

$$324 \times 260 =$$

84 240

7. [Decimal +, -] *

$$42.19 + 1.3 + 0.58 =$$

44.07

8. [Decimal ×, ÷] *

$$1.5 \div 0.03 =$$

50

9. [Fraction +, -] *

$$\frac{3}{4} + \frac{1}{5} =$$

$\frac{19}{20}$

10. [Fraction ×, ÷] *

$$\frac{5}{6} \div \frac{2}{5} =$$

$2\frac{1}{12}$

11. [Percentages] *

At the 2016 Rio Olympics, 2 of the 10 medals won by Croatia were bronze. What percentage is this?

20%

12. [Decimals / Fractions / Percents] *

Complete the table:

Decimal	Fraction	Percent
0.2	$\frac{1}{5}$	20%

13. [Integers]

$$-6 \times (-6) =$$

36

14. [Rates / Ratios] *

A cricket pitch is approximately 21 m long and 3 m wide. Find the ratio of length to width.

7:1

15. [Indices / Square Roots] *

Between which two consecutive whole numbers does $\sqrt{10}$ lie?

3 and 4

16. [Order of Operations] *

$$(-4 - 1)^2 \times 4 \div 1 =$$

100

17. [Exploring Numbers]

Choose the integers from this list:

$\frac{15}{10}$, 63, -2, 1968, 3.14

63, -2, 1968

18. [Multiples / Factors / Primes] *

Express 80 as a product of its prime factors using index notation.

$80 = 2^4 \times 5$

19. [Number Patterns] *

Find the 15th term in the pattern:

3, 13, 23, 33, 43, ...

143

20. [Expressions]

Simplify

$$5v + 2v - v + 3w$$

$6v + 3w$

21. [Substitution] *

If $k = 9$, find the value of $3(k - 8)$

3

22. [Equations] *

Solve for f :

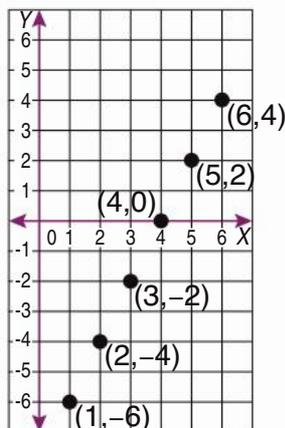
$$5f = 20$$

$f = 4$

23. [Coordinates]

Using the table of values, plot the points on the Cartesian plane.

x	1	2	3	4	5	6
y	-6	-4	-2	0	2	4



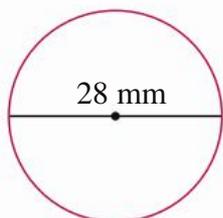
24. [Units of Measurement / Time] *

The movie begins at 6:40 pm and ends at 8:30 pm. How long is the movie in hours and minutes?

1 h 50 min

25. [Perimeter] *

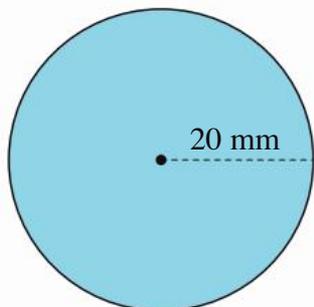
Using $C = 2\pi r$ where $\pi \approx \frac{22}{7}$, calculate the circumference of the circle.



88 mm

26. [Area / Volume] *

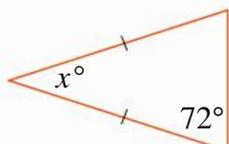
Using $A = \pi r^2$ and $\pi \approx 3.14$, find the area of the circle.



1256 mm²

27. [Shapes] *

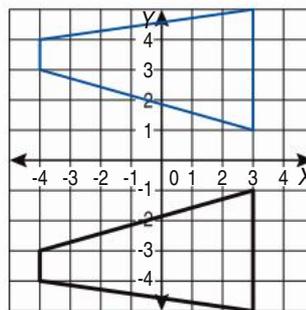
Find the value of x° .



36°

28. [Location / Transformation]

Redraw this trapezium after reflecting it in the x-axis.



29. [Statistics] *

This stem-and-leaf plot shows the number of annual vacation days for the twelve largest countries in the world. Find the median of the data.

Stem	Leaf
1	3 5
2	0 0 5 5 7 8
3	4 5 7
4	2

1 | 0 = 10

26

30. [Probability] *

A survey of a local suburb showed that 15% of the population was under 12 years old, and 21% of the population was over 60 years. What is the probability that a person selected at random was aged between 12 and 60 years? [Give your answer as a percentage.]

64%

31. [Problem Solving 1] *

John asked Miriam to tell him her age. She replied, "If you divide my age by 3, you will get the same answer as when you divide 75 by my age." How old is Miriam?

15

32. [Problem Solving 2] *

At noon, Trevor and Kim start running from the same point. Trevor runs east at a speed of 8 km/h and Kim runs west at a speed of 6 km/h. At what time will they be 21 km apart?

1:30 pm

33. [Problem Solving 3] *

Each letter represents a different digit. If $GOD = 605$, what number does $MOVED$ represent?

	A	D	A	M
	A	N	D	
+	E	V	E	
<hr/>				
	M	O	V	E
	D			

10395



Name:

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QUOTE OF THE WEEK

Folks are usually about as happy as they make their minds up to be.
Abraham Lincoln

1. [+ Whole Numbers to 10]

	-8	12	15	-24	9	7	3	10	-11	26
+ 6	-2	18	21	-18	15	13	9	16	-5	32

2. [- Whole Numbers to 10]

	26	4	17	3	-10	31	9	12	15	-18
- 7	19	-3	10	-4	-17	24	2	5	8	-25

3. [× Whole Numbers to 12]

	9	6	12	8	4	11	-5	3	10	7
× 9	81	54	108	72	36	99	-45	27	90	63

4. [+ Whole Numbers to 12]

	40	20	80	110	50	90	60	70	-30	120
÷ 10	4	2	8	11	5	9	6	7	-3	12

5. [Large Number +, -] *

$$4539 + 216 + 541 =$$

5296

6. [Large Number ×, ÷] *

$$107 \times 3800 =$$

406 600

7. [Decimal +, -] *

$$22.31 + 4.9 + 0.248 =$$

27.458

8. [Decimal ×, ÷] *

$$0.36 \div 0.6 =$$

0.6

9. [Fraction +, -] *

$$\frac{3}{7} + \frac{1}{2} =$$

$\frac{13}{14}$

10. [Fraction ×, ÷] *

$$\frac{1}{2} \div \frac{3}{8} =$$

$1\frac{1}{3}$

11. [Percentages] *

An elephant weighs 5000 kg. It eats 150 kg of food each day. What percentage of its own weight does an elephant eat each day?

3%

12. [Decimals / Fractions / Percents] *

Complete the table:

Decimal	Fraction	Percent
0.8	$\frac{80}{100} = \frac{4}{5}$	80%

13. [Integers]

$$-5 \times 7 =$$

-35

14. [Rates / Ratios] *

Rainforests represent 6% of the land on earth, and contain half of all living things. Find the ratio of rainforests to other habitats.

3:47

15. [Indices / Square Roots] *

Between which two consecutive whole numbers does $\sqrt{35}$ lie?

5 and 6

16. [Order of Operations] *

$$3^2 + (3 + 4) \times (-2) =$$

-5

17. [Exploring Numbers]

Choose the integers from this list:

$\frac{3}{6}$, 5.2, 10, -4, 197

10, -4, 197

18. [Multiples / Factors / Primes] *

Express 132 as a product of its prime factors using index notation.

$132 = 2^2 \times 3 \times 11$

19. [Number Patterns] *

Find the 10th term in the pattern:

1, 8, 27, 64, ...

1000

20. [Expressions]

Simplify $2m + 3p - p + m$

$3m + 2p$

21. [Substitution] *

If $p = 7$, find the value of $p(2 + p)$

63

22. [Equations] *

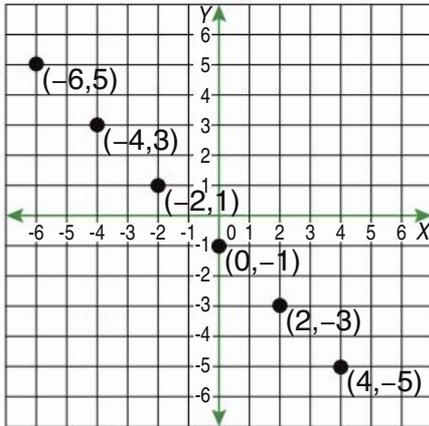
Solve for p : $8p = -64$

$p = -8$

23. [Coordinates]

Using the table of values, plot the points on the Cartesian plane.

x	-6	-4	-2	0	2	4
y	5	3	1	-1	-3	-5



24. [Units of Measurement / Time] *

The interview began at 13:30 and ended at 14:50. How long was the interview in hours and minutes?

1 h 20 min

25. [Perimeter] *

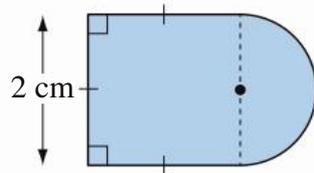
Using $\pi \approx \frac{22}{7}$ calculate the circumference of the top of the stool.



132 cm

26. [Area / Volume] *

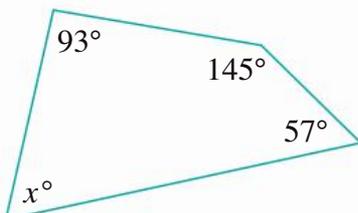
Using $\pi \approx 3.14$ find the area of the shape.



5.57 cm²

27. [Shapes] *

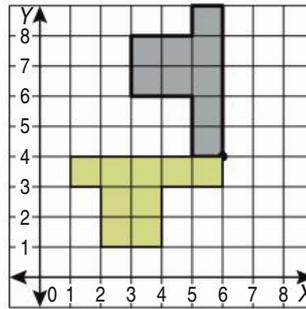
Find the value of x° .



65°

28. [Location / Transformation]

Redraw this shape after rotating it 90° clockwise about the point of coordinates (6,4).



29. [Statistics] *

This stem-and-leaf plot shows the mean annual rainfall for Queenstown, New Zealand. Find the median of the data.

Stem	Leaf
5	8
6	5 9
7	2 3 5 7 8
8	0 2 9
9	5

7|0 = 70 mm

76

30. [Probability] *

When a die is rolled, what is the probability of rolling a 2 or a 5?

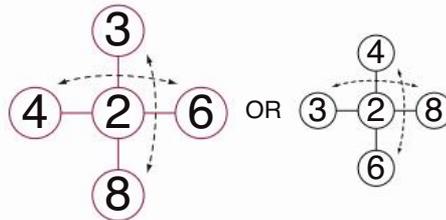
[Give your answer as a fraction in simplest form.]



$\frac{1}{3}$

31. [Problem Solving 1] *

Place the digits 2, 3, 4, 6 and 8 in the circles so the three numbers on each line give the same product, and the product is as small as possible.



32. [Problem Solving 2] *

In how many ways can 12 one-dollar coins be shared between Josh, Frank and Suzie, if each of them receives at least 3 coins?

10

33. [Problem Solving 3] *

Sandra walked to the top of a hill at a speed of 2 km/h, turned around and walked down the hill at a rate of 4 km/h. The whole trip took 6 hours. How many kilometres is it to the top of the hill?

8 km



Name:

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QUOTE OF THE WEEK

What would life be if we had no courage to attempt anything?
Vincent Van Gogh

1. [+ Whole Numbers to 10]

	31	10	-18	24	19	2	-3	17	15	6
+ 4	35	14	-14	28	23	6	1	21	19	10

2. [- Whole Numbers to 10]

	21	-27	4	30	5	19	12	-8	16	3
- 3	18	-30	1	27	2	16	9	-11	13	0

3. [× Whole Numbers to 12]

	5	9	-8	6	3	7	11	-4	12	10
× 8	40	72	-64	48	24	56	88	-32	96	80

4. [+ Whole Numbers to 12]

	60	45	40	50	25	35	-55	20	15	-30
÷ 5	12	9	8	10	5	7	-11	4	3	-6

5. [Large Number +, -] *

$$5378 + 1948 + 366 =$$

7692

6. [Large Number ×, ÷] *

$$209 \times 1500 =$$

313 500

7. [Decimal +, -] *

$$4.5 + 27 + 2.503 =$$

34.003

8. [Decimal ×, ÷] *

$$2.8 \div 0.07 =$$

40

9. [Fraction +, -] *

$$\frac{5}{12} - \frac{2}{5} =$$

$\frac{1}{60}$

10. [Fraction ×, ÷] *

$$\frac{3}{10} \div \frac{2}{5} =$$

$\frac{3}{4}$

11. [Percentages] *

Of the approximately 225 species of shark, 18 are dangerous to humans. What percentage is this?

8%

12. [Decimals / Fractions / Percents] *

Complete the table:

Decimal	Fraction	Percent
0.94	$\frac{47}{50}$	94%

13. [Integers]

$$-3 \times (-9) =$$

27

14. [Rates / Ratios] *

In Australia the size of a typical home has increased from 220 m² to 245 m² over the past 10 years. Find the ratio of house area today compared to 10 years ago.

49 : 44

15. [Indices / Square Roots] *

Between which two consecutive whole numbers does $\sqrt{50}$ lie?

7 and 8

16. [Order of Operations] *

$$1 + (-2)^3 \div (-5 + 4) =$$

9

17. [Exploring Numbers]

Choose the integers from this list:

$\frac{12}{3}$, 1850, 4.5, -17, 0.1

$\frac{12}{3}$, 1850, -17

18. [Multiples / Factors / Primes] *

Express 300 as a product of its prime factors using index notation.

$300 = 2^2 \times 3 \times 5^2$

19. [Number Patterns] *

Find the 20th term in the pattern:

$\frac{1}{20}, \frac{1}{19}, \frac{1}{18}, \frac{1}{17}, \dots$

1

20. [Expressions]

Simplify $4q + 3 + q - 2$

$5q + 1$

21. [Substitution] *

If $e = -8$, find the value of $3(e - 1)$

-27

22. [Equations] *

Solve for x :

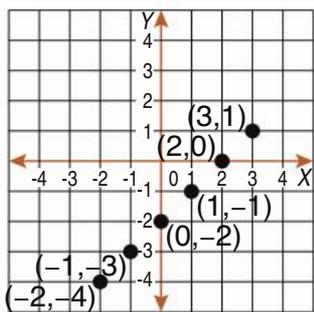
$$\frac{x}{10} = 2$$

$x = 20$

23. [Coordinates]

Using the table of values, plot the points on the Cartesian plane.

x	-2	-1	0	1	2	3
y	-4	-3	-2	-1	0	1



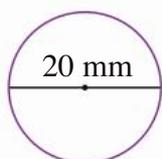
24. [Units of Measurement / Time] *

School starts at 8:55 am and ends at 2:45 pm. How long is a school day in hours and minutes?

5 h 50 min

25. [Perimeter] *

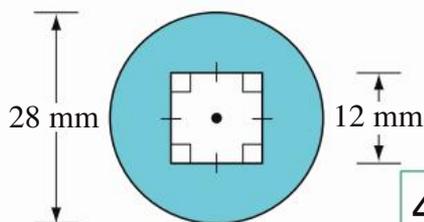
Using $\pi \approx 3.14$ calculate the circumference of the circle.



62.8 mm

26. [Area / Volume] *

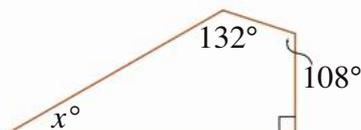
Using $\pi \approx \frac{22}{7}$ find the shaded area.



472 mm²

27. [Shapes] *

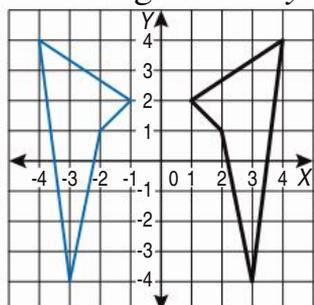
Find the value of x° .



30°

28. [Location / Transformation]

Redraw this quadrilateral after reflecting it in the y-axis.



29. [Statistics] *

This stem-and-leaf plot shows the number of floors of the twenty tallest buildings in the world. Find the median and range of the data.

Stem	Leaf
10	1 1 1 1 1 2 3 4 5 6 8
11	0 1 5 7 8
12	0 3 8
16	3

4 | 3 = 43

median = 107 range = 62

30. [Probability] *

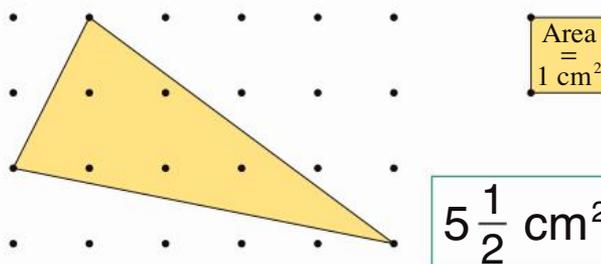
A bag contains 6 white, 2 black and 10 green marbles. If a marble is selected at random, find the probability that it is a black or a green marble.

[Give your answer as a fraction in simplest form.]

$\frac{2}{3}$

31. [Problem Solving 1] *

What is the area of the triangle in square centimetres?



5 $\frac{1}{2}$ cm²

32. [Problem Solving 2] *

A maths test consists of ten questions. Ten points are given for each correct answer, and three points are deducted for each incorrect answer. If Sue attempted all the questions and scored 61 points, how many correct answers did she give?

7

33. [Problem Solving 3] *

On Monday, the escalator was not working. It took Tom 18 seconds to reach the top, climbing two steps each second. By Tuesday the escalator had been repaired and Tom took only 12 seconds to reach the top climbing at the same rate. On Wednesday Tom decided to ride the escalator without climbing at all. How long did it take to reach the top this time?

36 s



Name:

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QUOTE OF THE WEEK

There is hope for anyone who can look in the mirror and laugh at what he sees.

1. [+ Whole Numbers to 10]

	23	14	-1	10	-9	2	16	8	-15	7
+ 5	28	19	4	15	-4	7	21	13	-10	12

2. [- Whole Numbers to 10]

	6	17	19	24	10	2	-15	21	-3	28
- 9	-3	8	10	15	1	-7	-24	12	-12	19

3. [× Whole Numbers to 12]

	-3	8	7	-11	6	9	4	12	5	10
× 6	-18	48	42	-66	36	54	24	72	30	60

4. [÷ Whole Numbers to 12]

	49	-70	28	42	7	63	84	35	-56	21
÷ 7	7	-10	4	6	1	9	12	5	-8	3

5. [Large Number +, -] *

$$74 + 2092 - 777 =$$

1389

12. [Decimals / Fractions / Percents] *

Which is greater?

$$\frac{3}{10} \text{ or } 3\%$$

$\frac{3}{10}$

18. [Multiples / Factors / Primes] *

The number 9 has exactly three factors: 1, 3 and 9. Find the next number after 9 that has exactly three factors.

6. [Large Number ×, ÷] *

$$3477 \div 2 =$$

1738.5

13. [Integers]

$$48 \div (-8) =$$

-6

25

7. [Decimal +, -] *

$$8 - 0.7 =$$

7.3

14. [Rates / Ratios] *

A honey bee has wings that can beat 250 times per second. At this rate how many beats are recorded in a minute?

15 000 beats/min

19. [Number Patterns] *

If the general rule of a pattern is $n + 2$ find the 15th term ($n = 15$).

17

8. [Decimal ×, ÷] *

$$2 \div 0.4 =$$

5

15. [Indices / Square Roots] *

$$(-8)^2 =$$

64

20. [Expressions]

Simplify $4x + 9 - 2x - 6$

$2x + 3$

9. [Fraction +, -] *

$$5\frac{5}{9} - 3\frac{2}{9} =$$

$2\frac{1}{3}$

16. [Order of Operations] *

$$\sqrt{36 + 64} =$$

10

21. [Substitution] *

If $a = 5$ and $b = 2$, find the value of $a(a + b)$

35

10. [Fraction ×, ÷] *

$$\frac{3}{2} \times \frac{2}{9} =$$

$\frac{1}{3}$

17. [Exploring Numbers]

Which numbers are rational?

- A) -3
- B) $\frac{7}{8}$
- C) $\sqrt{18}$
- D) π

A and B

22. [Equations] *

Solve for x : $2x + 3 = 9$

$x = 3$

11. [Percentages] *

Roger made \$25 profit on the stamp collection costing him \$125. What was his profit as a percentage of the cost price?

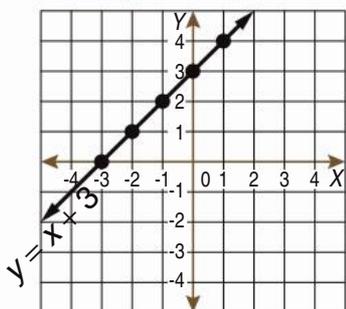
20%

23. [Coordinates] *

Graph the line of equation $y = x + 3$ by first completing this table of values.

[Label the line with the equation.]

x	-3	-2	-1	0	1
y	0	1	2	3	4
(x,y)	(-3,0)	(-2, 1)	(-1, 2)	(0, 3)	(1, 4)



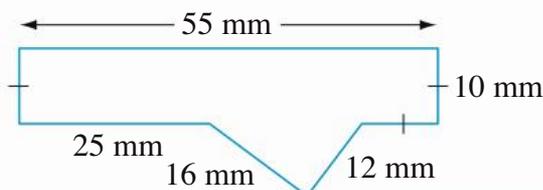
24. [Units of Measurement / Time] *

It is Monday, 0250 hours in Vancouver, Canada, and Monday, 2050 hours in Melbourne. By how many hours is Vancouver time behind Melbourne time?

18 h

25. [Perimeter] *

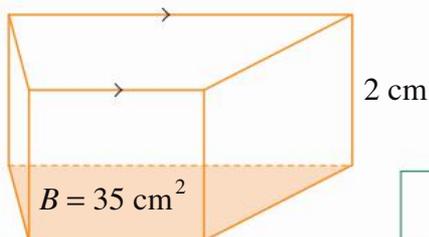
Calculate the perimeter of the polygon.



138 mm

26. [Area / Volume] *

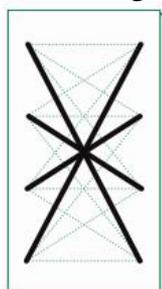
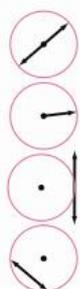
Using $\text{Volume} = \text{area of base} \times \text{height}$, find the volume of the prism.



70 cm³

27. [Shapes]

Match each diagram to its description:



chord

tangent

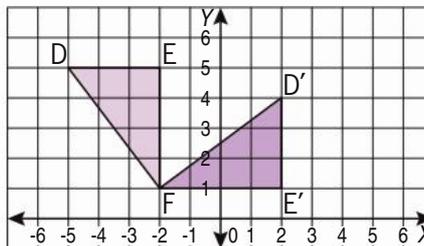
radius

diameter

28. [Location / Transformation]

Which transformation has moved triangle DEF?

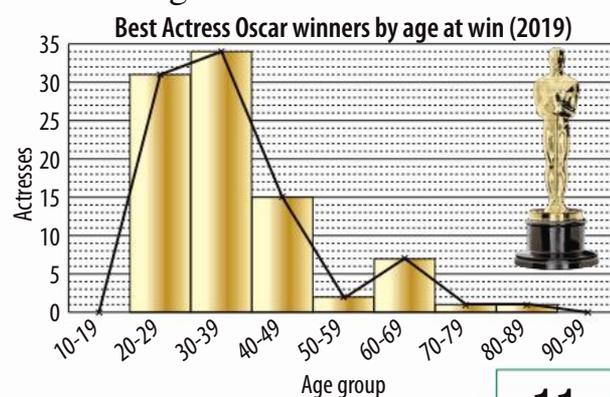
- A) a translation of -2 along the x -axis
- B) a reflection in the line $x = -2$
- C) a rotation of 90° clockwise



C

29. [Statistics]

How many Oscars have been won by actresses aged 50 or more?



11

30. [Probability] *

In how many ways can five books be arranged on a shelf?

120

31. [Problem Solving 1] *

A gardener wants to fence the largest possible rectangular area using 200 metres of fencing. Find the best length and width of the garden.

50 m \times 50 m

32. [Problem Solving 2] *

Michelle has \$14 in her purse in 5¢, 10¢ and 20¢ coins. If she has an equal number of each coin type, how many coins does Michelle have in her purse?

120

33. [Problem Solving 3] *

Using my tap, it takes 6 minutes to fill our water tank. Using the neighbour's hose, it takes 9 minutes. How long would it take if I used both the tap and the hose?

3 min 36 s



Name:

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QUOTE OF THE WEEK

Fashion - That which is unwearable until everyone else is wearing it, by which time it is unfashionable.
Rossiter

1. [+ Whole Numbers to 10]

	-9	14	13	-17	18	-1	12	6	15	0
+ 7	-2	21	20	-10	25	6	19	13	22	7

2. [- Whole Numbers to 10]

	25	14	-9	18	27	22	3	10	-21	26
- 6	19	8	-15	12	21	16	-3	4	-27	20

3. [× Whole Numbers to 12]

	3	10	11	5	8	-6	12	9	4	7
× 8	24	80	88	40	64	-48	96	72	32	56

4. [+ Whole Numbers to 12]

	24	108	84	-48	132	120	-36	72	60	96
÷ 12	2	9	7	-4	11	10	-3	6	5	8

5. [Large Number +,-] *

$$527 + 8473 - 583 =$$

8417

12. [Decimals / Fractions / Percents] *

Which is greater?

$$0.8 \text{ or } \frac{3}{4}$$

0.8

18. [Multiples / Factors / Primes] *

The number 10 has exactly four factors: 1, 2, 5 and 10. Find the next number after 10 that has exactly four factors.

14

6. [Large Number ×,÷] *

$$1042 \div 5 =$$

208.4

13. [Integers]

$$99 \div (-11) =$$

-9

7. [Decimal +,-] *

$$2 - 0.64 =$$

1.36

14. [Rates / Ratios] *

It takes 3 minutes to fill a 60 L bathing pool. What is the average rate in litres per hour?

1200 L/h

19. [Number Patterns] *

If the general rule of a pattern is $n - 7$ find the 22nd term ($n = 22$).

15

8. [Decimal ×,÷] *

$$7 \div 0.2 =$$

35

15. [Indices / Square Roots] *

$$(-4)^3 =$$

-64

20. [Expressions]

Simplify $8a + 7 - 3a + 2$

5a + 9

10. [Fraction ×,÷] *

$$\frac{2}{3} \times \frac{3}{8} =$$

$\frac{1}{4}$

16. [Order of Operations] *

$$\sqrt{5^2 + 12^2} =$$

13

21. [Substitution] *

If $x = 10$ and $y = 7$, find the value of $2x(x - y)$

60

11. [Percentages] *

Tina bought her car for \$6000 and later sold it for \$4500. Find the loss as a percentage of the cost price.

25%

17. [Exploring Numbers]

Which is **not** a rational number?

A) 1.4143 B) $\frac{7}{6}$

C) $\sqrt{7}$ D) -28

C

22. [Equations] *

Solve for s : $4s - 5 = 11$

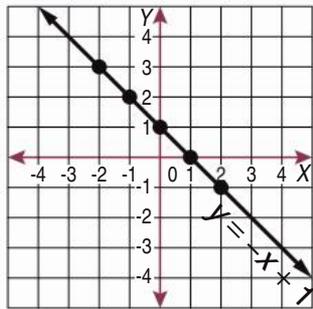
s = 4

23. [Coordinates] *

Graph the line of equation $y = -x + 1$ by first completing this table of values.

[Label the line with the equation.]

x	-2	-1	0	1	2
y	3	2	1	0	-1
(x,y)	(-2,3)	(-1, 2)	(0, 1)	(1, 0)	(2,-1)



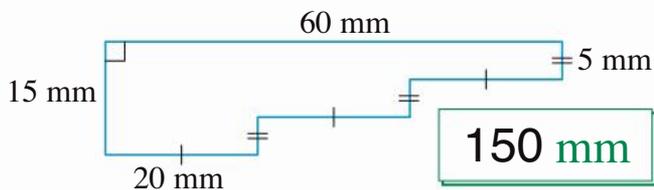
24. [Units of Measurement / Time] *

The rugby game starts at 1:30 pm in Auckland. If Chatham Island time is 45 minutes ahead of Auckland time, when should you turn on your TV on Chatham Island to catch the start of the game?

2:15 pm

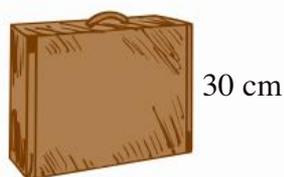
25. [Perimeter] *

Calculate the perimeter of the polygon.



26. [Area / Volume] *

Using $V = Bh$ find the volume of the briefcase.

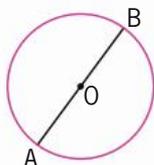


12000 cm³

27. [Shapes]

What is \overline{AB} in this diagram?

- A) radius
- B) circumference
- C) diameter
- D) tangent

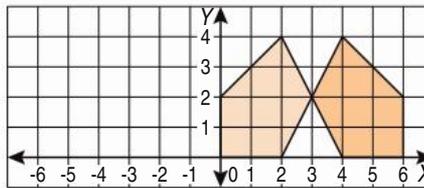


C

28. [Location / Transformation]

Which transformation has moved the shape?

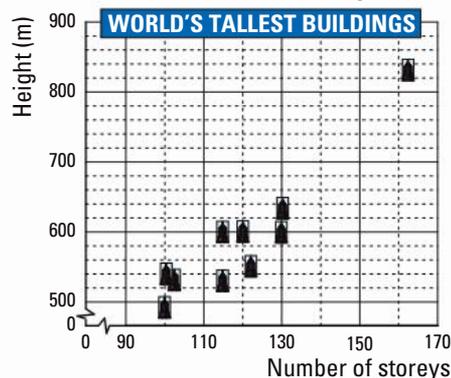
- A) a translation of 2 along the x -axis
- B) a reflection in the line $x = 3$
- C) a rotation of 180°



B

29. [Statistics]

How many of the buildings in this graph have 120 or more storeys?



5

30. [Probability] *

A deli has a lunch menu consisting of one sandwich, one dessert and one drink. How many lunch combinations are possible from these choices?

drink: tea, coffee, lemonade, water

sandwich: salad, ham, tuna, roast beef

dessert: pavlova, fruit

32

31. [Problem Solving 1] *

I think of a number, multiply it by 2, subtract 6 and then divide by 4. If the answer is 8, what is the original number?

19

32. [Problem Solving 2] *

The fraction of girls in our class has risen from $\frac{3}{7}$ to $\frac{1}{2}$ with the arrival of the Henderson triplet girls. How many students are there in our class now?

24

33. [Problem Solving 3] *

A clock gains 4 minutes every hour. One day it is set to the correct time, 9:00 am. What is the correct time when the clock shows 1:00 pm that afternoon?

12:45 pm



Name:

Due Date: / /

Parent's Signature:

QUOTE OF THE WEEK

"I think it would be a good idea."

Mahatma Gandhi

(When asked what he thought of Western Civilization.)

1. [+ Whole Numbers to 10]

	13	6	-7	-22	9	21	18	-15	10	4
+ 9	22	15	2	-13	18	30	27	-6	19	13

2. [- Whole Numbers to 10]

	-10	11	9	17	-8	12	26	13	25	4
- 5	-15	6	4	12	-13	7	21	8	20	-1

3. [× Whole Numbers to 12]

	9	3	12	-7	11	6	10	8	-4	5
× 7	63	21	84	-49	77	42	70	56	-28	35

4. [÷ Whole Numbers to 12]

	96	24	56	80	-48	64	40	88	-32	72
÷ 8	12	3	7	10	-6	8	5	11	-4	9

5. [Large Number +, -] *

$$849 + 3175 - 888 =$$

3136

6. [Large Number ×, ÷] *

$$3137 \div 4 =$$

784.25

7. [Decimal +, -] *

$$12 - 9.63 =$$

2.37

8. [Decimal ×, ÷] *

$$9 \div 0.03 =$$

300

9. [Fraction +, -] *

$$2\frac{3}{8} - \frac{5}{8} =$$

1 $\frac{3}{4}$

10. [Fraction ×, ÷] *

$$\frac{9}{10} \times \frac{2}{3} =$$

$\frac{3}{5}$

11. [Percentages] *

Aaron bought a motor home for \$50000. If he later sold it for \$10000, find the loss as a percentage of the cost price.

80%

12. [Decimals / Fractions / Percents] *

Which is greater?

40% or 0.04

40%

13. [Integers]

$$-24 \div (-6) =$$

4

14. [Rates / Ratios] *

The average heartbeat rate for persons 12 to 16 years old is 80 beats per minute at rest. At this rate how many times is the heart beating in two and a half hours?

12000

15. [Indices / Square Roots] *

$$(-12)^2 =$$

144

16. [Order of Operations] *

$$50 - 2^3 \times \sqrt{36} =$$

2

17. [Exploring Numbers]

Choose the rational numbers from the list:

$\frac{14}{28}$, $\sqrt{3}$, 0.6341, 15, π

$\frac{14}{28}$, 0.6341, 15

18. [Multiples / Factors / Primes] *

What is the smallest positive integer that has exactly eight factors?

24

19. [Number Patterns] *

If the general rule of a pattern is $33 - 3n$ find the 8th term ($n = 8$).

9

20. [Expressions]

Simplify

$$5t + 3u - 4t + u$$

$t + 4u$

21. [Substitution] *

If $p = 6$ and $q = 5$, find the value of $p^2 + pq$

66

22. [Equations] *

Solve for q :

$$3q - 1 = -10$$

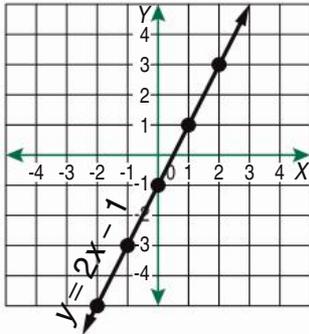
$q = -3$

23. [Coordinates] *

Graph the line of equation $y = 2x - 1$ by first completing this table of values.

[Label the line with the equation.]

x	-2	-1	0	1	2
y	-5	-3	-1	1	3
(x,y)	(-2,-5)	(-1,-3)	(0,-1)	(1,1)	(2,3)



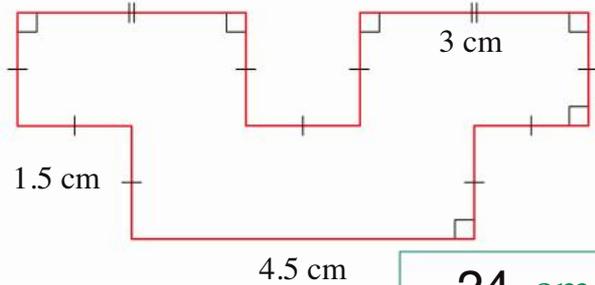
24. [Units of Measurement / Time] *

At 4:00 am on Christmas Day, 1974 the eye of Cyclone Tracy was directly over Darwin. If Perth time is 1.5 hours behind Darwin time, what was the time in Perth?

2:30 am

25. [Perimeter] *

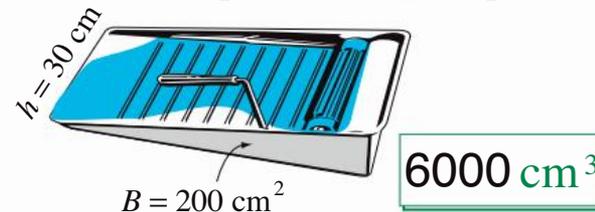
Calculate the perimeter of the polygon.



24 cm

26. [Area / Volume] *

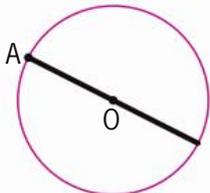
Using $V = Bh$ find the volume of the tray in the shape of a triangular prism.



6000 cm³

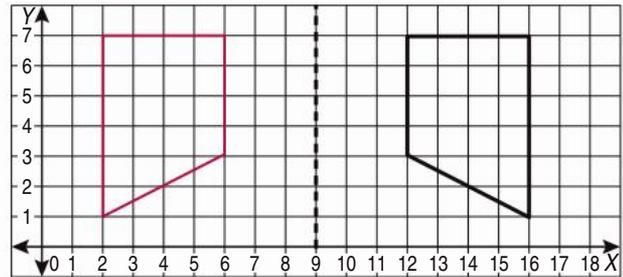
27. [Shapes]

Draw the diameter passing through A.



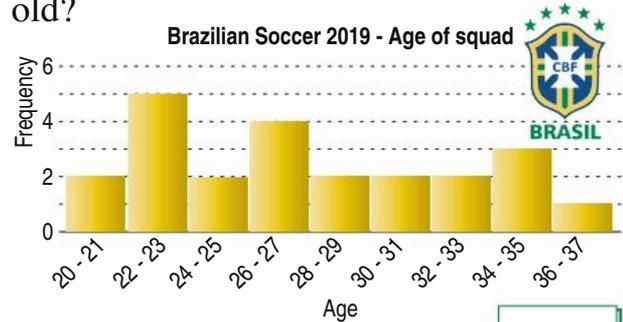
28. [Location / Transformation]

Redraw this trapezium after reflecting it in the line of equation $x = 9$



29. [Statistics]

How many soccer players in 2019 in the Brazilian squad were less than 26 years old?



9

30. [Probability] *

A one-dollar coin, a two-dollar coin and a six-sided die are tossed. How many results are possible?

24

31. [Problem Solving 1] *

How many digits are written when 1000^{2015} is expressed as a numeral?

6046

32. [Problem Solving 2] *

A computer is programmed to scan the digits of the counting numbers. For example, if it scans

1 2 3 4 5 6 7 8 9 10 11 12 13

then it has scanned 17 digits altogether.

If the computer begins its task and scans the first 1392 digits starting with 1, what is the last counting number scanned?

500

33. [Problem Solving 3] *

Eight soccer teams play each other once during a tournament. Two points are awarded for each win, one for each draw and zero for each loss. How many points must a team score to be sure that it will finish in the top four?

[The team must finish with more points than at least four other teams.]

11



Name:

Due Date: / /

Parent's Signature:

QUOTE OF THE WEEK

Bromiley's Maxim - What's not worth doing is not worth doing well.
Rossiter

1. [+ Whole Numbers to 10]

	14	-16	-12	10	7	1	-18	3	19	5
+ 8	22	-8	-4	18	15	9	-10	11	27	13

2. [- Whole Numbers to 10]

	24	12	16	-17	11	20	3	15	-19	8
- 7	17	5	9	-24	4	13	-4	8	-26	1

3. [× Whole Numbers to 12]

	9	8	5	-3	11	6	7	10	-4	12
× 5	45	40	25	-15	55	30	35	50	-20	60

4. [+ Whole Numbers to 12]

	18	66	48	36	-72	30	54	-24	42	60
÷ 6	3	11	8	6	-12	5	9	-4	7	10

5. [Large Number +,-] *

$$2000 + 50\,000 - 14\,973 =$$

37 027

6. [Large Number ×,÷] *

$$1724 \div 8 =$$

215.5

7. [Decimal +,-] *

$$5 - 3.841 =$$

1.159

8. [Decimal ×,÷] *

$$6 \div 0.8 =$$

7.5

9. [Fraction +,-] *

$$3\frac{1}{10} - 1\frac{3}{10} =$$

1 $\frac{4}{5}$

10. [Fraction ×,÷] *

$$\frac{5}{18} \times \frac{9}{10} =$$

$\frac{1}{4}$

11. [Percentages] *

An antique vase was bought for \$80 and was later sold for \$240. Find the profit as a percentage of the cost price.

200%

12. [Decimals / Fractions / Percents] *

Which is greater?

$\frac{2}{3}$ or 60%

$\frac{2}{3}$

13. [Integers]

$$-64 \div 8 =$$

-8

14. [Rates / Ratios] *

A Ferrari with a 5.5 L engine has a city consumption of 23 litres of fuel per 100 km. How much fuel does it need for a 20 km city trip?

4.6 L

15. [Indices / Square Roots] *

$$(-2)^5 =$$

-32

16. [Order of Operations] *

$$\sqrt{16} - 3 \times 4 + 3^3 =$$

19

17. [Exploring Numbers]

Choose the rational numbers from the list:

$\frac{24}{299}$, -6.78, 40, $\sqrt{7}$, -9

$\frac{24}{299}$, -6.78, 40, -9

18. [Multiples / Factors / Primes] *

List the 3 smallest positive integers that have exactly four factors.

6, 8 and 10

19. [Number Patterns] *

If the general rule of a pattern is $n^2 + 4$ find the 6th term ($n = 6$).

40

20. [Expressions]

Simplify

$$9z + 6y + y - 5z$$

4z + 7y

21. [Substitution] *

If $v = 8$ and $w = 3$, find the value of $2v - w^2$

7

22. [Equations] *

Solve for k:

$$7k + 16 = 2$$

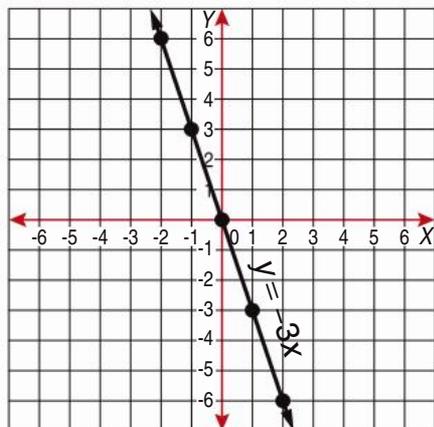
k = -2

23. [Coordinates] *

Graph the line of equation $y = -3x$ by first completing this table of values.

[Label the line with the equation.]

x	-2	-1	0	1	2
y	6	3	0	-3	-6
(x,y)	(-2,6)	(-1, 3)	(0, 0)	(1, -3)	(2, -6)



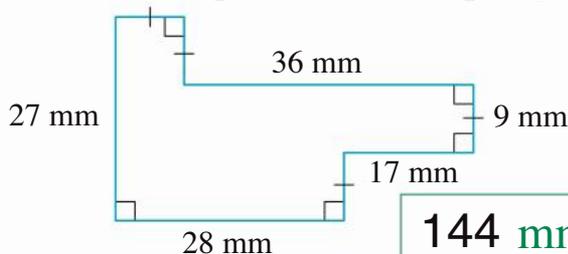
24. [Units of Measurement / Time] *

Mick departs Sydney on Tuesday at 6:00 am and arrives in Christchurch on Tuesday at 12:45 pm. If Christchurch time is 2 hours ahead of Sydney time, how long was the flight?

4 h 45 min

25. [Perimeter] *

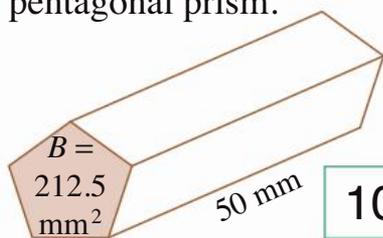
Calculate the perimeter of the polygon.



144 mm

26. [Area / Volume] *

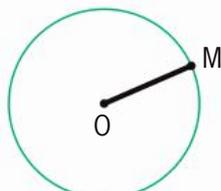
Using $V = Bh$ find the volume of the pentagonal prism.



10625 mm³

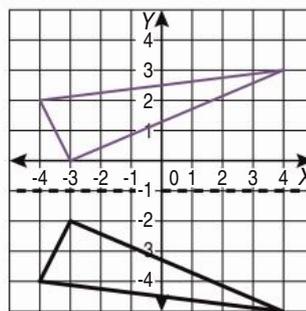
27. [Shapes]

Draw the radius passing through M.



28. [Location / Transformation]

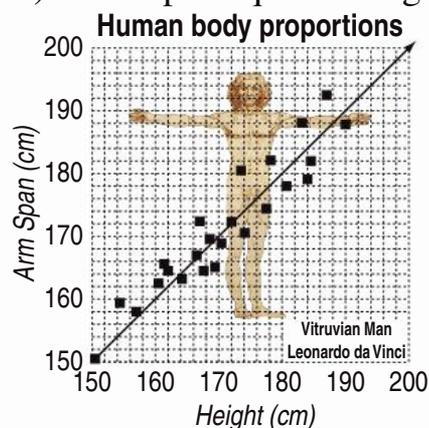
Redraw this triangle after reflecting it in the line of equation $y = -1$



29. [Statistics]

Which best describes the relationship?

- A) Height taller than arm span
- B) Height shorter than arm span
- C) Arm span equal to height



C

30. [Probability] *

A test has five True/False questions. If you answer each question with True or False and leave none of them blank, in how many ways can you answer the whole test?

32

31. [Problem Solving 1] *

Peter and David live 36 km apart. They leave their homes at 1:00 pm riding bicycles toward each other. Peter averages 8 km/h and David averages 10 km/h. At what time do they meet?

3:00 pm

32. [Problem Solving 2] *

Four consecutive whole numbers are added. If the smallest number is $n - 1$, what is the sum of the four numbers?

$4n + 2$

33. [Problem Solving 3] *

If n is an integer, which of the following must be an odd integer?

- A) $3n$
- B) $n^2 + 3$
- C) $n + 3$
- D) $2n^2 + 3$

D

MATHS MATE



Teacher Resource



Teacher's Guide to the Use of Maths Mate

pages i - viii



Student Workbook Answers

pages 3 - 72



Student Workbook Short Answers

pages 1 - 8



Problem Solving Hints & Solutions

pages 1 - 20



Test Masters

pages 1 - 32



Test Answers

pages 1 - 32



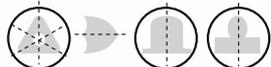
Record Keeping Sheets

pages 1 - 10

1.1

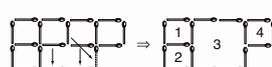
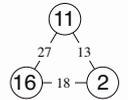
1. 7,9,14,11,10, 16,13,5,12,18
2. 11,13,4,2,9, 5,7,8,6,10
3. 8,10,20,16,14, 22,6,12,18,24
4. 1,2,8,9,6, 7,4,3,10,5
5. 2204
6. 307
7. 8.38
8. 3.5
9. $\frac{6}{7}$
10. $2\frac{1}{7}$
11. 85%
12. 0.6
13. -6, -2, 3, 5, 7
14. 3 : 5
15. 36
16. 24
17. 60
18. 20, 40, 60
19. 34, 42
20. $3t$
21. 31
22. 6
23. B4
24. 16000 mm
25. 150 mm
26. yes
27. 85°
28. 4
29. North America
30. 9
31. 25
32. his own son
33. Paul

1.2

1. 6,7,11,3,9, 12,8,5,10,4
2. 17,5,4,8,10, 6,2,9,11,3
3. 12,21,15,6,3, 18,27,9,30,24
4. 6,1,4,8,3, 7,9,5,10,2
5. 4081
6. 220
7. 56.6
8. 62.2
9. $\frac{7}{13}$
10. 6
11. 77%
12. 0.15
13. >
14. 10 : 7
15. 81
16. 39
17. 4
18. 21, 42, 63
19. 19, 13
20. $2m$
21. 7
22. 7
23. Whyalla
24. 20 cm
25. 21 cm
26. no
27. 160°
28. 
29. chocolate
30. 20
31. 1 : 3
32.

+	3	8	5	4
2	5	10	7	6
6	9	14	11	10
12	15	20	17	16
9	12	17	14	13
33. G = \$250
B = \$1250
R = \$500

1.3

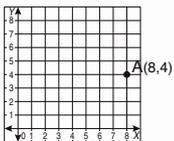
1. 14,17,12,15,11, 20,18,16,19,13
2. 3,10,7,4,9, 5,2,6,8,11
3. 25,40,55,30,45, 60,50,35,15,20
4. 8,7,12,4,6, 11,3,5,10,9
5. 5415
6. 6300
7. 8.19
8. 60 500
9. $1\frac{2}{5}$
10. 2
11. 16%
12. 2.25
13. <
14. 1 : 4
15. 0
16. 9
17. 0.05 or $\frac{5}{100}$
18. 30
19. 3.2, 3.5
20. $5hi$
21. 2
22. 9
23. C(4,0) D(6,3)
24. 460 mm
25. 14 cm
26. 13 sq. units
27. 30°
28. 
29. dog
30. 36
31. 
32. 
33. 72 m

1.4

1. 16,10,17,13,11, 9,14,12,15,8
2. 10,8,4,3,7, 1,5,6,2,9
3. 48,32,28,44,16, 24,12,36,20,40
4. 4,11,8,12,7, 10,6,9,3,5
5. 6120
6. 504
7. 90.8
8. 3490
9. $1\frac{5}{9}$
10. $1\frac{3}{4}$
11. 2.5%
12. 0.025
13. 5, 3, -3, -7, -9
14. 1 : 5
15. 25
16. 25
17. 0.009 or $\frac{9}{1000}$
18. 36
19. 2, 0.5
20. ij
21. 5
22. 34
23. K(-2,3) L(-4,-4)
M(1,-2)
24. 8500 m
25. 133 mm
26. 19 sq. units
27. 110°
28. 
29. B
30. 8
31. VOLUMES, RECTANGLE, NUMBER
32. D = 5 M = 7
33. D

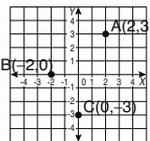
1.5

- 26,13,18,11,17, 24,9,20,22,15
- 20,23,5,9,7, 12,21,4,6,18
- 28,84,56,77,35, 42,21,49,70,63
- 11,5,10,4,6, 7,12,9,3,8
- 8918
- 182 600
- 3.92
- 7.2
- $\frac{6}{7}$
- 3 kg
- \$65
- $\frac{3}{4}$
- 9170 m
- 1860 m
- 10
- 8
- B
- yes
- 18, 22.5
- 4x
- 6
- 5



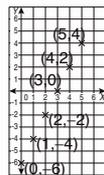
1.6

- 11,24,22,10,17, 9,13,16,25,18
- 24,12,27,21,9, 5,18,10,23,26
- 42,60,30,54,72, 36,24,18,48,66
- 7,11,6,8,12, 5,9,10,3,4
- 7327
- 307 000
- 19.1
- 32.4
- $3\frac{1}{2}$
- \$40
- \$75
- $\frac{4}{5}$
- 7 h
- 30 min
- 100
- 35
- A
- no
- 3.5, 4.2
- 4xy
- 35
- 10



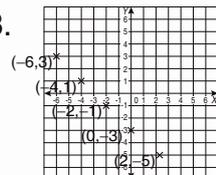
1.7

- 29,15,13,26,30, 23,28,21,14,7
- 21,6,7,12,18, 5,9,16,23,4
- 99,66,55,121,44, 88,110,11,77,33
- 2,6,1,9,5, 10,4,7,3,8
- 6763
- 209 400
- 5.03
- 10.83
- $5\frac{1}{2}$
- 12 m
- 25¢
- $\frac{3}{4}$
- 50°C
- 4800 m
- 100 000
- 6
- B
- 1,2,3,4,6,8,12,24
- 10.5, 12.6
- 2q
- 6
- 9



1.8

- 29,25,14,26,11, 18,23,22,30,17
- 7,19,8,12,21, 20,6,25,13,4
- 7,3,1,10,9, 4,8,2,5,6
- 6,11,9,4,5, 7,12,8,10,3
- 6443
- 75 000
- 4.27
- 32.576
- $1\frac{2}{7}$
- 30 L
- \$1.80
- $\frac{2}{3}$
- 9004 m
- 30 000 km/h
- 1 000 000
- 36
- A
- 1,2,3,6,9,18,27,54
- 360, 900
- 7s
- 21
- 4



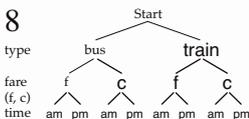
- 5000 g
- 14 cm
- 500 mm²
-

- 2 kg
- 90 mm
- 6 cm²
-

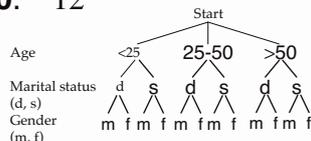
- 4000 kg
- 80 mm
- 480 mm²
-

- 7200 g
- 104 mm
- 4.4 cm²
-

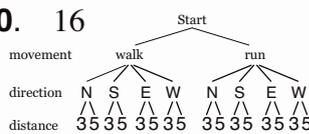
- 1.5 km
- 18 - 24
- 8



- 2400 m
- 2004 Indonesia
- 12



- 5000 km
- 3
- 16

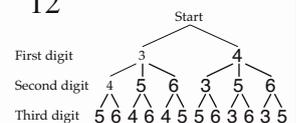


-

- 18
- 27
- 28

- 22
-
- 22

- 700 km
- Melbourne
- 12



- male = 125
female = 125
- 13

- 6 cm
- $\frac{1}{5}$
- 45



2.1

1. 11,16,4,13,15, 8,17,20,12,19
2. 7,12,6,8,0, 5,13,9,1,4
3. 110,60,30,100,80, 70,40,90,120,50
4. 10,4,6,3,9, 5,2,7,11,8
5. 1197
6. 630
7. 91.6
8. 0.09
9. $1\frac{2}{9}$
10. 15
11. 360
12. $\frac{2}{5} = \frac{18}{45}$
13. carpark (C)
14. 25 km
15. 10
16. 5
17. 2115
18. 1, 2, 7, 14
19. 48, 192
20. $a + c$
21. -5
22. 27
23. (5, -5)
24. 21 000 cm
25. 30 mm
26. 7.5 cm^2
- 27.
28. 90°
29. entry level 4
30. $\frac{1}{13}$
31. 57
32. 6
33. 8

2.2

1. 7,21,25,14,20, 19,16,13,12,18
2. 1,19,7,12,15, 0,18,4,13,16
3. 10,24,12,22,14, 16,6,18,8,20
4. 7,4,3,6,9, 12,8,5,11,10
5. 2562
6. 509
7. 6.75
8. 0.27
9. $1\frac{5}{8}$
10. 5
11. 28
12. $\frac{20}{48} = \frac{5}{12}$
13. -4 m
14. 5 m/min
15. 4
16. 11
17. 24 050
18. 1, 2, 4, 8, 16
19. 16.2, 48.6
20. $x - 80$
21. 6
22. -8
23. (-3,2)
24. 5400 mm
25. 96 mm
26. 12 cm^2
- 27.
28. 45°
29. Sydney
30. $\frac{1}{2}$
31. 6, 7, 8, 9, 10
32. 15
33. \$3993

2.3

1. 3,7,10,14,18, 11,15,19,12,16
2. 10,3,7,19,11, 6,4,15,8,2
3. 30,60,35,55,15, 40,50,25,45,20
4. 7,3,5,10,12, 6,11,9,8,2
5. 4389
6. 248
7. 14.09
8. 2.659
9. $\frac{3}{5}$
10. $4\frac{2}{3}$
11. 4.5
12. $\frac{2}{3} = \frac{6}{9} = \frac{36}{54}$
13. \$2600
14. 12 min
15. 12
16. 8
17. twenty thousand, three hundred
18. 8
19. $1, \frac{1}{4}$
20. $40m$ or $40 \times m$
21. 9
22. -24
23. (4,1)
24. 0.7 km
25. 137.5 m
26. 425 mm^2
- 27.
28. 60°
29. Charlotte Pass
30. $\frac{3}{4}$
31. 10
32. kittens = 4
trees = 3
33. 48

2.4

1. 18,14,13,16,20, 17,19,15,11,22
2. 4,1,7,6,13, 0,2,19,8,5
3. 28,42,84,70,49, 21,77,56,63,35
4. 6,5,10,12,8, 3,7,11,4,9
5. 3545
6. 816
7. 82.8
8. 0.5487
9. $1\frac{4}{11}$
10. 10
11. 4
12. $\frac{5}{6} = \frac{25}{30} = \frac{75}{90}$
13. 55 m
14. 3 min
15. 11
16. 18
17. six hundred and five thousand
18. 9
19. 1.2, 0.4
20. $y + 36$
21. 0
22. 28
23. (1,2)
24. 3.5 m
25. 8.4 m
26. 330 mm^2
- 27.
28. 270°
29. Montreal 1976
30. $\frac{2}{5}$
31. 7
32. 14
33. 6

2.5

- 14, 17, 13, 25, 18, 22, 6, 21, 19, 30
- 7, 20, 1, 14, 8, 2, 15, 16, 13, 9
- 132, 48, 108, 60, 144, 84, 96, 120, 36, 72
- 4, 11, 8, 12, 5, 7, 9, 3, 10, 6
- 3221
- 301
- 11.9
- 0.42
- $\frac{2}{3}$
- $\frac{3}{10}$
- \$30
- 0.11
- 479 BC
- 3 : 5 : 12
- 3600
- 2
- 4800
- 83
- 9, 12
- z, 3z
- 20
- 8

No. of hours (x)	Distance travelled in km (90x)
1	90 × 1 = 90
2	90 × 2 = 180
3	90 × 3 = 270
4	90 × 4 = 360
5	90 × 5 = 450
6	90 × 6 = 540

- 1500 mL
- 18.5 cm
- 105 cm³
- regular tetrahedron
-
- 21.5
- $\frac{3}{10}$
- \$1.11
- 421
- 61 = 6² + 4² + 3² or
= 7² + 2² + 2² + 2² or
= 5² + 4² + 4² + 2² or
= 6² + 5²

2.6

- 21, 24, 9, 15, 30, 28, 16, 22, 17, 13
- 3, 9, 7, 4, 21, 40, 6, 8, 2, 15
- 90, 99, 63, 27, 108, 54, 72, 36, 81, 45
- 8, 11, 4, 12, 7, 3, 6, 10, 5, 9
- 2842
- 1458
- 17.7
- 1.12
- $\frac{1}{5}$
- $\frac{5}{24}$
- \$49
- 9%
- 476 AD
- 2 : 6 : 9
- 2500
- 2
- 910
- 53, 59
- 61, 85
- g, 2g
- 22
- 5

x	y = 10 - x	y
5	y = 10 - 5 = 5	5
6	y = 10 - 6 = 4	4
7	y = 10 - 7 = 3	3
8	y = 10 - 8 = 2	2
9	y = 10 - 9 = 1	1
10	y = 10 - 10 = 0	0

- 0.6 L
- 17 cm
- 96 cm³
- triangular prism
-
- median = 71
mode = 63
- $\frac{13}{22}$
-
- | | | | | |
|---|----|----|----|----|
| x | 4 | 7 | 5 | 9 |
| 3 | 12 | 21 | 15 | 27 |
| 5 | 20 | 35 | 25 | 45 |
| 6 | 24 | 42 | 30 | 54 |
| 7 | 28 | 49 | 35 | 63 |
- Chloe & David on a tandem bike

2.7

- 12, 29, 16, 38, 17, 11, 23, 20, 26, 24
- 22, 9, 6, 1, 4, 18, 23, 5, 17, 20
- 88, 33, 121, 66, 77, 99, 110, 132, 44, 55
- 3, 11, 7, 10, 12, 6, 9, 8, 4, 5
- 7259
- 30 204
- 7.94
- 2.25
- $\frac{1}{2}$
- $\frac{8}{15}$
- \$45
- 60%
- 183°C
- 6 : 4 : 3
- 4900
- 12
- 24 000
- 9, 15, 21
- 13, 8
- vw, 3vw
- 51
- 3

x	y = 5x	y
0	y = 5 × 0 = 0	0
1	y = 5 × 1 = 5	5
2	y = 5 × 2 = 10	10
3	y = 5 × 3 = 15	15
4	y = 5 × 4 = 20	20
5	y = 5 × 5 = 25	25

- 10.5 L
- 170 mm
- 6250 mm³
- hexagonal prism
-
- mean = 59
range = 100
- $\frac{3}{8}$
- $\frac{17}{7}$
- 8
- 3, 10, 24 & 37

2.8

- 21, 27, 18, 24, 15, 22, 26, 20, 29, 13
- 22, 6, 13, 18, 7, 19, 24, 11, 20, 5
- 48, 16, 28, 44, 12, 40, 24, 20, 36, 32
- 4, 11, 7, 10, 5, 9, 6, 12, 8, 3
- 9600
- 16 872
- 1.39
- 0.91
- $1\frac{1}{6}$
- $\frac{2}{33}$
- \$255
- 0.003
- 65 m
- 4 : 7 : 5
- 6400
- 77
- 16 200
- 30, 32, 33, 34, 35, 36
- 125, 216
- 2ab, ab
- 7
- 12

x	y = x - 3	y
0	y = 0 - 3 = -3	-3
1	y = 1 - 3 = -2	-2
2	y = 2 - 3 = -1	-1
3	y = 3 - 3 = 0	0
4	y = 4 - 3 = 1	1
5	y = 5 - 3 = 2	2

- 12 800 mL
- 131 mm
- 15 cm³
-
-
- mean = 31
range = 113
- $\frac{1}{60}$
- 99, 67
- $\frac{1}{2}$
- 10

3.1

- 12, 16, 23, -4, 20, 18, 26, 35, 19, -7
- 16, -8, 23, 5, 8, 9, -13, 10, 14, 11
- 48, 72, 24, 88, 32, 96, 56, 80, 64, 40
- 12, 7, 3, 10, 5, 9, 8, 11, 4, 6
- 18465
- 14705
- 92.12
- 3
- 4
- $\frac{1}{20}$
- A
- 1.5
- 4
- B
- 50
- 25
- 0.42, 0.24, 0.204, 0.04, 0.024
- $$= 7 \times 8$$

$$= 7 \times 2 \times 4$$

$$= 7 \times 2 \times 2 \times 2$$
- 10, 15
- $x + y$
- 315
- 0.8
- C
- 2 min
- 110 mm
- 39 sq. units
- 48°
-
- 3 years
- E
- 2nd
- 20
- 9

3.2

- 18, -1, 9, 4, 16, -6, 17, 22, 11, 13
- 14, -11, 8, 5, 0, -15, 3, 6, 2, 9
- 120, 70, 110, 40, 100, 30, 90, 80, 50, 60
- 4, 7, 10, 11, 5, 9, 6, 12, 8, 3
- 80218
- 8748
- 26.19
- 2
- $3\frac{2}{5}$
- $\frac{2}{15}$
- B
- 0.75
- 5
- 3
- 120
- 42
- $\frac{3}{4}$
- $$= 8 \times 9$$

$$= 2 \times 4 \times 3 \times 3$$

$$= 2 \times 2 \times 2 \times 3 \times 3$$
- 35, 17
- $12n$ or $12 \times n$
- 100
- 1.4
-
- 300 min
- 15 cm
- 1575 mm^2
- 26°
-
- 2009
- C
- 80
- | | | | | | |
|----|---|----|---|----|----|
| 1 | - | 5 | - | 2 | -6 |
| - | x | x | + | + | |
| 9 | - | 8 | + | 4 | 7 |
| + | | + | + | + | |
| 3 | + | 7 | + | 6 | 16 |
| -2 | | 47 | | 12 | |
- 55

3.3

- 24, 3, 19, 22, 28, 16, 21, 23, 17, -2
- 4, -1, 7, -15, 16, 5, 8, -14, 1, 10
- 33, 12, 27, 18, 24, 36, 21, 30, 9, 15
- 4, 11, 10, 6, 12, 9, 8, 3, 5, 7
- 74047
- 56148
- 42.8
- 15
- $4\frac{1}{2}$
- $\frac{1}{21}$
- B
- $\frac{2}{5}$
- 8
- 4
- 90
- 242
- $\frac{7}{10}$
- $$= 8 \times 12$$

$$= 2 \times 4 \times 2 \times 6$$

$$= 2 \times 2 \times 2 \times 2 \times 2 \times 3$$
- 5, 3
- $2d$ cm
- 10
- 5
-
- 260 s
- 180 mm
- 12 cm^2
- 33°
-
- 3
- B
- 12
- 1:20.24 pm
- 572

3.4

- 18, 2, 29, 16, 21, -11, 10, 22, 15, -7
- 6, 0, 14, 1, -15, -2, 13, 2, -17, 9
- 48, 66, 42, 18, 30, 60, 36, 24, 72, 54
- 5, 8, 11, 9, 4, 12, 10, 3, 6, 7
- 30179
- 86072
- 67.8
- 29
- $4\frac{2}{3}$
- $\frac{2}{7}$
- B
- $\frac{2}{25}$
- 6
- 63
- 110
- 20
- $\frac{2}{5}, \frac{2}{3}, \frac{3}{4}$
- $$= 12 \times 16$$

$$= 3 \times 4 \times 4 \times 4$$

$$= 3 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$$
- 4, 1
- $s - 25$
- 22
- 4
-
- 80 min
- 15 cm
- 7 cm^2
- 20°
-
- Hubble Space Telescope
- A
- 3
- 20
- 35

3.5

1. 12,2,20,5,14,
-9,29,28,-3,13
2. 2,14,-3,1,18,
5,16,9,-9,10
3. 63,27,72,45,36,
18,54,90,81,99
4. 4,8,5,10,3,
7,1,9,12,6
5. 34 150
6. 131
7. 80.16
8. 0.024
9. $\frac{9}{10}$
10. $\frac{1}{7}$
11. 160
12. 70%
13. 10
14. B
15. 1
16. 16
17. 5
18. $45 = 3 \times 3 \times 5$
19. -3, -8
20. $h + 2i$
21. 98
22. $x = 5$
23. 22 min
24. 72 months
25. 3.5 cm
26. 11 cm^2
27. 63°
- 28.
29. aluminium
30. $\frac{1}{2}$
31. 62
32. 3
33. June from China

3.6

1. 13,16,22,1,11,
14,-10,28,15,-7
2. 15,1,18,14,32,
6,23,-15,-1,10
3. 121,66,132,99,77,
44,88,55,110,33
4. 3,6,2,7,10,
4,9,1,5,8
5. 59 100
6. 12
7. 19.86
8. 0.287
9. $\frac{5}{12}$
10. $\frac{7}{12}$
11. 1.6
12. 25%
13. -6
14. A
15. 27
16. 81
17. 7.8
18. $16 = 2 \times 2 \times 2 \times 2$
19. -4, 2
20. $2j + k$
21. 28
22. $c = 15$
23. 6
24. 11.3 km
25. 25 mm
26. 450 mm^2
27. 108°
- 28.
29. dogs & cats
30. $\frac{1}{6}$
31.
$$\begin{array}{r} \boxed{7} \boxed{1} \\ \times \boxed{5} \boxed{3} \\ \hline 213 \\ 3550 \\ \hline 3763 \end{array}$$
32. 134
33. 31

3.7

1. 14,28,17,20,1,
11,13,26,-6,19
2. 4,19,2,18,3
-29,7,0,-13,21
3. 63,21,49,84,56,
35,70,77,42,28
4. 5,11,4,8,3
7,10,6,2,9
5. 24087
6. 680
7. 7.74
8. 0.09
9. $\frac{3}{4}$
10. $\frac{10}{33}$
11. 180
12. $\frac{9}{20}$
13. -7
14. A
15. 64
16. 10
17. 1.45
18. $44 = 2 \times 2 \times 11$
19. -8, 1
20. $pq + 2mp$
21. -36
22. $a = 12$
23. 400 m
24. more
25. 33 mm
26. 560 mm^2
27. 90°
- 28.
29. B
30. $\frac{3}{7}$
31. 3
32. posts = 18
rails = 36
33. 4

3.8

1. 20,23,29,14,31,
17,-12,-1,12,28
2. 22,5,-1,14,21,
-11,28,10,-30,13
3. 40,50,20,45,30,
15,55,25,35,60
4. 12,4,5,9,10,
3,6,7,11,8
5. 48 660
6. 2480
7. 88.75
8. 0.927
9. $\frac{4}{5}$
10. $\frac{1}{54}$
11. 60
12. $\frac{4}{25}$
13. 2
14. B
15. 1
16. 108
17. 0.048
18. $120 = 2 \times 2 \times 2 \times 3 \times 5$
19. -33, -41
20. ab
21. 4
22. $r = 6$
23. 25 m
24. 40
25. 12 mm
26. 473 mm^2
27. 75°
- 28.
29. oil
30. $\frac{1}{3}$
31. 70 cm
32.

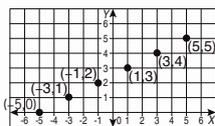
Other solutions are possible but 4 must be in the centre.
33. 30

4.1

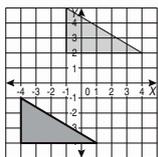
- 17, -16, 16, 34, 21, 15, 19, 10, 18, -7
- 8, -5, 19, 6, -15, 1, 24, 7, 2, -32
- 28, 44, 20, 12, 24, -16, 36, 48, 40, 32
- 4, 6, 9, 12, 7, 8, 5, -3, 1, 10
- 1640
- 17040
- 43.75
- 0.3
- $\frac{7}{15}$
- $\frac{5}{36}$
- 20%

Decimal	Fraction	Percent
0.03	$\frac{3}{100}$	3%

- 72
- 1 : 4
- 2 and 3
- 4
- 43, 200
- $27 = 3^3$
- 6
- $3s + 3t$
- 18
- $y = 7$



- 10 h 40 min
- 157 mm
- 154 mm^2
- $x = 55^\circ$ $y = 135^\circ$



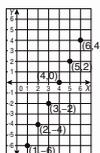
- | Stem | Leaf |
|------|---------------------|
| 21 | 6 8 |
| 22 | 3 4 5 |
| 23 | 4 5 5 6 6 6 8 8 8 9 |
- $\frac{7}{10}$
- 1
- 65%
- 21

4.2

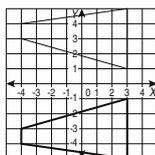
- 30, 12, -1, 11, 28, 3, -18, 23, 17, 24
- 8, -27, 4, 20, -15, 25, 2, -23, -4, 13
- 108, 60, 144, 72, 36, 120, 132, 96, 84, -48
- 11, 6, 2, 10, -4, 7, 3, 9, -8, 5
- 1837
- 84 240
- 44.07
- $\frac{50}{19}$
- $\frac{19}{20}$
- $2\frac{1}{12}$
- 20%

Decimal	Fraction	Percent
0.2	$\frac{1}{5}$	20%

- 36
- 7 : 1
- 3 and 4
- 100
- 63, -2, 1968
- $80 = 2^4 \times 5$
- 143
- $6v + 3w$
- 3
- $f = 4$



- 1 h 50 min
- 88 mm
- 1256 mm^2
- 36°



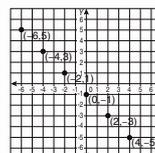
- 26
- 64%
- 15
- 1:30 pm
- 10 395

4.3

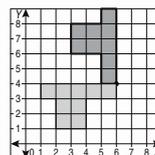
- 2, 18, 21, -18, 15, 13, 9, 16, -5, 32
- 19, -3, 10, -4, -17, 24, 2, 5, 8, -25
- 81, 54, 108, 72, 36, 99, -45, 27, 90, 63
- 4, 2, 8, 11, 5, 9, 6, 7, -3, 12
- 5296
- 406 600
- 27.458
- 0.6
- $\frac{13}{14}$
- $1\frac{1}{3}$
- 3%

Decimal	Fraction	Percent
0.8	$\frac{80}{100} = \frac{4}{5}$	80%

- 35
- 3 : 47
- 5 and 6
- 5
- 10, -4, 197
- $132 = 2^2 \times 3 \times 11$
- 1000
- $3m + 2p$
- 63
- $p = -8$



- 1 h 20 min
- 132 cm
- 5.57 cm^2
- 65°



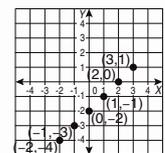
- $\frac{76}{3}$
- $\frac{1}{3}$
-
- 10
- 8 km

4.4

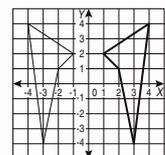
- 35, 14, -14, 28, 23, 6, 1, 21, 19, 10
- 18, -30, 1, 27, 2, 16, 9, -11, 13, 0
- 40, 72, -64, 48, 24, 56, 88, -32, 96, 80
- 12, 9, 8, 10, 5, 7, -11, 4, 3, -6
- 7692
- 313 500
- 34.003
- 40
- $\frac{1}{60}$
- $\frac{3}{4}$
- 8%

Decimal	Fraction	Percent
0.94	$\frac{47}{50}$	94%

- 27
- 49 : 44
- 7 and 8
- 9
- $\frac{12}{3}$, 1850, -17
- $300 = 2^2 \times 3 \times 5^2$
- 1
- $5q + 1$
- 27
- $x = 20$



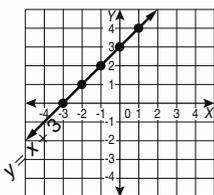
- 5 h 50 min
- 62.8 mm
- 472 mm^2
- 30°



- median = 107, range = 62
- $\frac{2}{3}$
- $5\frac{1}{2} \text{ cm}^2$
- 7
- 36 s

4.5

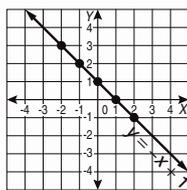
- 28, 19, 4, 15, -4, 7, 21, 13, -10, 12
- 3, 8, 10, 15, 1, -7, -24, 12, -12, 19
- 18, 48, 42, -66, 36, 54, 24, 72, 30, 60
- 7, -10, 4, 6, 1, 9, 12, 5, -8, 3
- 1389
- 1738.5
- 7.3
- 5
- $2\frac{1}{3}$
- $\frac{1}{3}$
- 20%
- $\frac{3}{10}$
- 6
- 15 000 beats/min
- 64
- 10
- A and B
- 25
- 17
- $2x + 3$
- 35
- $x = 3$



- 18 h
- 138 mm
- 70 cm^3
- chord
 - tangent
 - radius
 - diameter
- C
- 11
- 120
- $50\text{ m} \times 50\text{ m}$
- 120
- 3 min 36 s

4.6

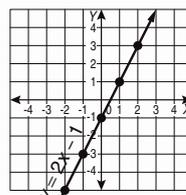
- 2, 21, 20, -10, 25, 6, 19, 13, 22, 7
- 19, 8, -15, 12, 21, 16, -3, 4, -27, 20
- 24, 80, 88, 40, 64, -48, 96, 72, 32, 56
- 2, 9, 7, -4, 11, 10, -3, 6, 5, 8
- 8417
- 208.4
- 1.36
- 35
- $1\frac{1}{2}$
- $\frac{1}{4}$
- 25%
- 0.8
- 9
- 1200 L/h
- 64
- 13
- C
- 14
- 15
- $5a + 9$
- 60
- $s = 4$



- 2:15 pm
- 150 mm
- 12000 cm^3
- C
- B
- 5
- 32
- 19
- 24
- 12:45 pm

4.7

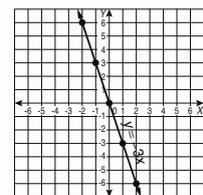
- 22, 15, 2, -13, 18, 30, 27, -6, 19, 13
- 15, 6, 4, 12, -13, 7, 21, 8, 20, -1
- 63, 21, 84, -49, 77, 42, 70, 56, -28, 35
- 12, 3, 7, 10, -6, 8, 5, 11, -4, 9
- 3136
- 784.25
- 2.37
- 300
- $1\frac{3}{4}$
- $\frac{3}{5}$
- 80%
- 40%
- 4
- 12 000
- 144
- 2
- $\frac{14}{28}, 0.6341, 15$
- 24
- 9
- $t + 4u$
- 66
- $q = -3$



- 2:30 am
- 24 cm
- 6000 cm^3
-
-
- 9
- 24
- 6046
- 500
- 11

4.8

- 22, -8, -4, 18, 15, 9, -10, 11, 27, 13
- 17, 5, 9, -24, 4, 13, -4, 8, -26, 1
- 45, 40, 25, -15, 55, 30, 35, 50, -20, 60
- 3, 11, 8, 6, -12, 5, 9, -4, 7, 10
- 37027
- 215.5
- 1.159
- 7.5
- $1\frac{4}{5}$
- $\frac{1}{4}$
- 200%
- $\frac{2}{3}$
- 8
- 4.6 L
- 32
- 19
- $\frac{24}{299}, -6.78, 40, -9$
- 6, 8 and 10
- 40
- $4z + 7y$
- 7
- $k = -2$



- 4 h 45 min
- 144 mm
- 10625 mm^3
-
-
- C
- 32
- 3:00 pm
- $4n + 2$
- D

MATHS MATE



Teacher Resource



Teacher's Guide to the Use of Maths Mate

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Student Workbook Answers

pages 3 - 72



Student Workbook Short Answers

pages 1 - 8



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Test Masters

pages 1 - 32



Test Answers

pages 1 - 32



Record Keeping Sheets

pages 1 - 10

A Teacher's Guide to approaching
PROBLEM SOLVING

Dear Educator

The following Problem Solving Hints & Solutions have been designed to support users of the Maths Mate Program.

The Maths Mate problem solving questions at each level have proved challenging for many.

Within these Hints & Solutions only one or two alternative strategies have been presented to show how the problem may be solved. Often many other approaches are both practical and possible; after all, "the human race has not really started to 'think'." - Edward De Bono

Outlined on this page is a general problem solving approach that may help you to develop the problem solving skills of your students.

Inevitably, students are more likely to be successful if they:

- *have the courage to try,*
- *can find a place to start and*
- *have approach options to choose from.*

Best wishes

The Maths Mate Team

FIRST:

- * Accept the challenge.
- * Read the problem.
- * Read the problem out loud.

THEN:

- * Find out the meaning of any unknown terms.
- * Highlight the essential truths.
- * Restate the problem in your own words.
- * Break the problem up into parts.

BE SURE ABOUT:

- * What you know from the problem. (Given)
- * What you need to find out. (Goal)

CHOOSE YOUR SOLUTION STRATEGY/STRATEGIES:

1. Write a numerical/algebraic equation deciding which operations to use, given the word statements.
2. Look for a pattern then make and test generalisations/conjectures that describe the relationship between variables.
3. Draw a diagram: sketch
table
graph
number line

OR Make a model.
4. Apply standard techniques or models.
e.g. Pythagoras' Theorem
5. Simplify the problem and work on a reduced version. Extrapolate back to the original problem.
6. Be systematic. Make a list. Progress step by step.
7. Work backwards if you have the answer.
8. Use trial and error. Estimate, check against the facts and then refine your estimation.

WHERE TO START:

- * Start: with what is known
with an odd or distinctive feature
with the smallest
with the easiest.

FINALLY:

- * Double check your answer against the original statements. Does your answer satisfy all the conditions of the problem?

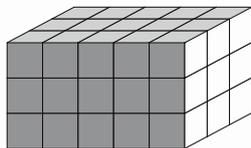
PRESENTATION:

- * Choose suitable modes of communication to present and explain your outcomes and results.

1.1

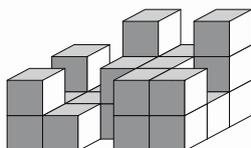
31. Hint: First consider the number of cubes in a completed layer. Then count the cubes in each layer by subtracting the missing cubes from the total.

Solution: In an array of $5 \times 3 \times 3$ cubes each complete layer would have:
 $5 \times 3 = 15$ cubes



Taking the layers one by one, this incomplete array has:

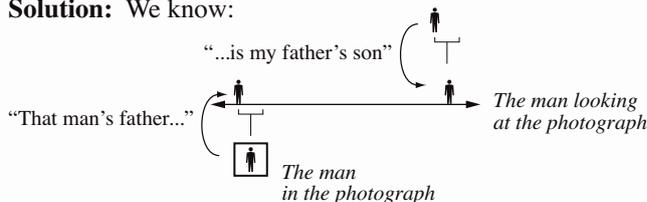
base layer	$15 - 1 = 14$ cubes
2nd layer	$15 - 6 = 9$ cubes
3rd layer	$15 - 13 = 2$ cubes
total	$= 25$ cubes



So **25** cubes remain.

32. Hint: Draw a family tree type diagram keeping the generations in line.

Solution: We know:



We also know that the man has no brothers or sisters. So "That man's father" must be himself and the photograph is of **his own son**.

33. Hint: Draw a table to help your reasoning.

Solution: From the given information we can immediately put into the table:

Lakisha has a bulldog, so she does not have a horse.
 Angela's brother is Ken, so she cannot be the sister of Paul.

Name	Brother	Pet
Angela	Ken	
Lakisha		bulldog
Jessica		

The horse and a brother named Paul are mentioned together, so they must be connected to Jessica.

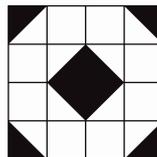
Name	Brother	Pet
Angela	Ken	
Lakisha		bulldog
Jessica	Paul	horse

Paul is Jessica's brother.

1.2

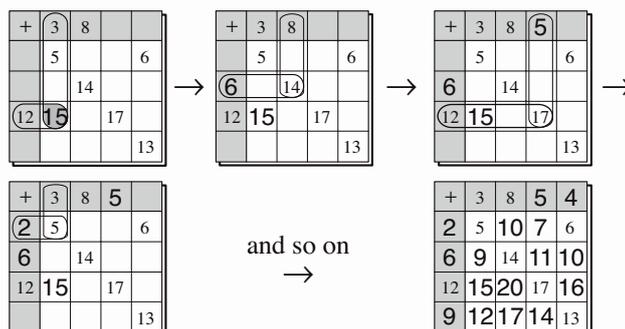
31. Hint: Determine the area covered by the black portion and the white portion of the design.

Solution: The total area of the design is 16 square units. The area covered by the black portion is represented by 8 triangles each covering half of a square unit. So the total black area is $\frac{1}{2} \times 8 = 4$ square units. The area covered by the white portion is the remainder. So the total white area is $16 - 4 = 12$ square units. The ratio of the black portion of the design to the white portion of the design is 4 : 12 or **1 : 3**.



32. Hint: The addition table has the numbers to be added in the first row and the first column. Their sums go in the corresponding intersecting spaces. Look for sums where 2 of these 3 facts are known.

Solution:



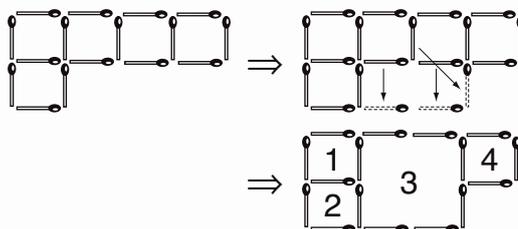
33. Hint: Look at the total cost and the cost of two bikes.

Solution: If all three bikes cost \$2000 and the green and blue bikes cost \$1500, then the red bike must cost the difference between these prices which is **\$500**. If the green and red bikes cost \$750, then the green bike costs **\$250**. If the red and green bikes cost \$750, then the blue bike costs **\$1250**.

1.3

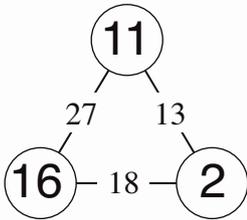
31. Hint: Make a model. Use trial and error:

Solution:

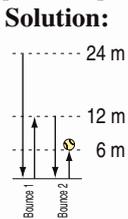


1.3 (cont.)

32. **Hint:** Try any reasonable guess in the top circle and observe your results.
Solution: Whatever you place in the top circle to get 27 and 13 on the sides, your two base circles must have the same difference, which is 14. You therefore require two numbers that have a difference of 14 but add to 18. By trial and error we find 2 and 16. The 16 must go on the left where the greater number is required for the 27. The 2 goes on the right and this leads to an 11 at the top.



33. **Hint:** Add the first 13 distances and then have an educated guess. OR Consider a ball dropped from twice the height and look at the difference in the number patterns produced.



Distance travelled by the ball by the time it comes to rest:

$$24 + 12 + 12 + 6 + 6 + 3 + 3 + \frac{3}{2} + \frac{3}{2} + \frac{3}{4} + \frac{3}{4} + \frac{3}{8} + \frac{3}{8} + \dots$$

$$= 24 + 24 + 12 + 6 + 3 + \frac{3}{2} + \frac{3}{4} + \dots$$

$$= 71\frac{1}{4} + \dots$$

Notice that after the first term, every new term seems to move the total half way to 72. (i.e. 24 is half the difference between 72 and 24, 12 is half the difference between 72 and 48, etc.)
 The ball has travelled 72 metres by the time it comes to rest.

OR

Let the distance travelled be D .

$$D = 24 + 24 + 12 + 6 + 3 + \frac{3}{2} + \frac{3}{4} + \dots$$

Consider a ball dropped from twice the height. It will clearly travel twice the distance.

$$2D = 48 + 48 + 24 + 12 + 6 + 3 + \frac{3}{2} + \frac{3}{4} + \dots$$

The difference between the two distances is $2D - D = D$

$$\text{or } 48 + 48 + 24 + 12 + 6 + 3 + \frac{3}{2} + \frac{3}{4} + \dots$$

$$- 24 - 24 - 12 - 6 - 3 - \frac{3}{2} - \frac{3}{4} - \dots$$

$$= 72$$

The ball has travelled 72 metres by the time it comes to rest.

1.4

31. **Hint:** Write the letters in a circle. Use trial and error. Group letters that make common word endings or word beginnings.

Solution:

M	L	O
U		V
S		E

Consider that the word may end in 'S' and that the letter 'V' will have a vowel next to it \Rightarrow **VOLUMES**

T	L	A
N		R
E		G
C		E

Consider possible letter groupings: ance, green, antle, angle, etc. and then look at the remaining letters to unjumble any possible whole words \Rightarrow **RECTANGLE**

E	B	U
M		R
		N

Consider that the word may start with 'RE' or end in 'ER' and then look at the remaining letters to unjumble any possible whole words \Rightarrow **NUMBER**

32. **Hint:** Draw a table of possible loads when the mule has twice the load. Work backwards.

Solution: If the donkey (D) gave the mule (M) a sack, then the mule would have twice as many sacks as the donkey.

So, possible loads if mule gets extra sack:

D	1	2	3	4	5
M	2	4	6	8	10

mule has twice as many sacks

\therefore Original loads:

D	2	3	4	5	6
M	1	3	5	7	9

\therefore Loads if donkey gets extra sack:

D	3	4	5	6	7
M	0	2	4	6	8

equal loads

The donkey (D) was carrying 5 sacks and the mule (M) was carrying 7 sacks.

33. **Hint:** Consider the factors of 6.

Solution: Factors of 6: 1, 2, 3, 6

If a number is multiplied by 6, the resulting number becomes a multiple of 6, and therefore a multiple of 1, 2 and 3. So the resulting number must be a multiple of 3, therefore D) is correct.

Checking other options:

A) Multiplying a number by 6 does not guarantee that the answer is a square number. e.g. $13 \times 6 = 78$ (not a square number)

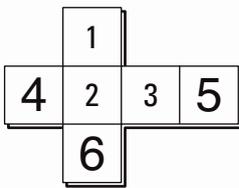
B) Multiplying a number by 6 cannot give a prime number as the answer, because a prime number cannot have 6 as a factor.

C) Multiplying a number by 6 does not guarantee that the answer is a multiple of 12. e.g. $13 \times 6 = 78$ (not a multiple of 12)

So when a whole number is multiplied by 6 the answer must be a multiple of 3, therefore the answer is **D**.

31. **Hint:** Make a model of the cube. Copy, cut and fold the net.

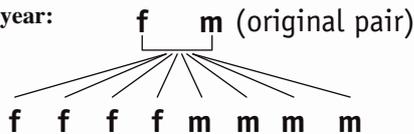
Solution: See diagram:



32. **Hint:** Draw a family tree diagram.

Solution:

First year:



⇒ 4 female (f) and 4 male (m) mice are born:

$$(4 + 1) + (4 + 1)$$

$$= 5 + 5$$

$$= 10$$

Altogether Cassandra now has 5 female and 5 male mice.

Second year: Five female mice each gave birth to eight mice, four male and four female.

⇒ 20 female (f) and 20 male (m) mice are born.

$$(20 + 4 + 1) + (20 + 4 + 1)$$

$$= 25 + 25$$

$$= 50$$

Altogether Cassandra now has 25 female and 25 male mice.

Third year: Twenty-five female mice each gave birth to eight mice, four male and four female.

⇒ 100 female (f) and 100 male (m) mice are born.

$$(100 + 20 + 4 + 1) + (100 + 20 + 4 + 1)$$

$$= 125 + 125$$

$$= 250$$

Cassandra now has **125** female and **125** male mice.

33. **Hint:** Make an organised list. All four darts may have the same score.

Solution: All possible point totals are:

4 identical darts:

$$1 + 1 + 1 + 1 = 4$$

$$4 + 4 + 4 + 4 = 16$$

$$7 + 7 + 7 + 7 = 28$$

$$10 + 10 + 10 + 10 = 40$$

3 identical darts:

$$1 + 1 + 1 + 4 = 7$$

$$1 + 1 + 1 + 7 = 10$$

$$1 + 1 + 1 + 10 = 13$$

$$4 + 4 + 4 + 1 = 13$$

$$4 + 4 + 4 + 7 = 19$$

$$4 + 4 + 4 + 10 = 22$$

$$7 + 7 + 7 + 1 = 22$$

$$7 + 7 + 7 + 4 = 25$$

$$7 + 7 + 7 + 10 = 31$$

$$10 + 10 + 10 + 1 = 31$$

$$10 + 10 + 10 + 4 = 34$$

$$10 + 10 + 10 + 7 = 37$$

2 identical darts:

$$1 + 1 + 4 + 4 = 10$$

$$1 + 1 + 7 + 7 = 16$$

$$1 + 1 + 10 + 10 = 22$$

$$1 + 1 + 4 + 7 = 13$$

$$1 + 1 + 4 + 10 = 16$$

$$1 + 1 + 7 + 10 = 19$$

$$4 + 4 + 7 + 7 = 22$$

$$4 + 4 + 10 + 10 = 28$$

$$4 + 4 + 1 + 10 = 19$$

$$4 + 4 + 7 + 10 = 25$$

$$7 + 7 + 10 + 10 = 34$$

$$7 + 7 + 1 + 4 = 19$$

$$7 + 7 + 1 + 10 = 25$$

$$7 + 7 + 4 + 10 = 28$$

$$10 + 10 + 1 + 4 = 25$$

$$10 + 10 + 1 + 7 = 28$$

$$10 + 10 + 4 + 7 = 31$$

non-identical darts:

$$1 + 4 + 7 + 10 = 22$$

After eliminating double-up totals the list is:

4, 7, 10, 13, 16, 19, 22, 25, 28, 31, 34, 37 and 40.

There are **13** different point totals possible.

1.6

31. **Hint:** Work backwards and do the opposite. Draw a diagram.

Solution:



If at the end you subtract 5, then do the opposite and add 5.

$$10 + 5 = 15$$

Continue in this way. If you multiply by 3 then divide by 3.

$$15 \div 3 = 5$$

If you add 2 then subtract 2.

$$5 - 2 = 3$$

If you divide by 6 then multiply by 6.

$$3 \times 6 = 18$$

Double check 18 as your result by working forwards.

$$18 \div 6 = 3$$

$$3 + 2 = 5$$

$$5 \times 3 = 15$$

$$15 - 5 = 10 \text{ (true)}$$



The number is **18**.

1.6 (cont.)



32. **Hint:** List all possible combinations of 3 colours, by starting with all containing one particular colour and decreasing the number of stripes of that colour from 3 to none. The order in each combination must be considered.

Solution: The combinations of three colour stripes starting with 3 red stripes are:
 RRR (3 red stripes)
 RRB, RRY, RBR, RYR, BRR, YRR (2 red stripes)
 RBB, RBY, RYY, RYB, BRB, YRY, BRY, YRB, BBR, YYR, BYR, YBR (1 red stripe)
 BBB, BBY, BYB, YBB, BYY, YBY, YYB, YYY (no red stripe)
 There are **27** possible flags using 3 different coloured stripes, with each colour being used more than once.

33. **Hint:** Test each number individually.

Solution: Factors of 20 other than itself : 1, 2, 4, 5, 10
 $1 + 2 + 4 + 5 + 10 = 22$
 $\Rightarrow 20$ is not a perfect number
 Factors of 24 other than itself : 1, 2, 3, 4, 6, 8, 12
 $1 + 2 + 3 + 4 + 6 + 8 + 12 = 36$
 $\Rightarrow 24$ is not a perfect number
 Factors of 28 other than itself : 1, 2, 4, 7, 14
 $1 + 2 + 4 + 7 + 14 = 28$
 $\Rightarrow 28$ is a perfect number
 Factors of 32 other than itself : 1, 2, 4, 8, 16
 $1 + 2 + 4 + 8 + 16 = 31$
 $\Rightarrow 32$ is not a perfect number
 So **28** is also a perfect number.

32. **Hint:** Start with the row, column or diagonal that is complete and determine its sum. Then work with the lines that have only one unknown.

Solution: Start with the main diagonal:

$$1 + 4 + 14 + 15 = 34$$

Choose the second diagonal:

$$8 + 5 + ? + 10 = 34$$

$$? = 11$$

Then choose the fourth column:

$$10 + 6 + ? + 15 = 34$$

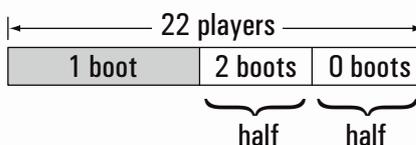
$$? = 3$$

Continue in this way till you place the numbers as shown:

1	16	7	10
13	4	11	6
12	5	14	3
8	9	2	15

33. **Hint:** No hints needed!

Solution: There are 22 members in the team:
 The one-legged members wear one boot each.
 Half of the rest of the team is wearing two boots and the other half is wearing none.
 On average these members also wear one boot each.

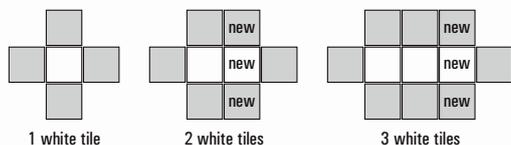


There are **22** boots worn by the team.

1.7

31. **Hint:** For each diagram, establish relationships between the number of white tiles and the number of green tiles.

Solution:



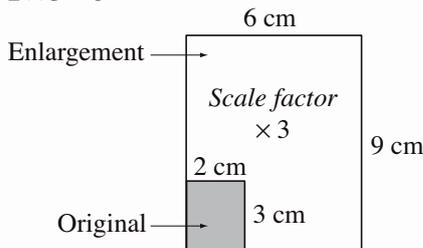
A. Each new diagram adds a white tile and two green tiles.
 B. The number of green tiles is twice the number of white tiles, plus the two green tiles on the sides.
 Therefore for 10 white tiles there are $10 \times 2 = 20$ green tiles on top and bottom, plus 2 more green tiles on the sides.
 To go around 10 white tiles using this pattern, **22** green tiles are needed.

1.8

31. **Hint:** When making enlargements consider the scale factor involved. Draw and label a diagram.

Solution: The height of the original photograph, 3 cm, has to be enlarged by 3 to produce a height of 9 cm, so the width must also be enlarged by a scale factor of 3.

$$2 \times 3 = 6$$



If the photo is enlarged proportionally to fit in the newspaper, the width of the photo will become **6** cm.

32. **Hint:** Cross simplify the fractions from left to right.
Solution: There are pairs of identical numbers (one as a denominator and other as a numerator) to be cancelled as follows:

$$= \frac{3}{\cancel{8}} \times \frac{\cancel{5}}{\cancel{7}} \times \frac{\cancel{7}}{\cancel{9}} \times \frac{\cancel{9}}{\cancel{11}} \times \frac{\cancel{11}}{\cancel{13}} \times \frac{\cancel{13}}{15} =$$

$$= \frac{3}{15}$$

$$= \frac{1}{5}$$

33. **Hint:** Make a list. Work systematically. Look for a pattern.
Solution: The list of all three-digit numbers which have 9 as the sum of their digits is as follows:

108 207 306 405 504 603 702 801 900
 117 216 315 414 513 612 711 810
 126 225 324 423 522 621 720
 135 234 333 432 531 630
 144 243 342 441 540
 153 252 351 450
 162 261 360
 171 270
 180

The possibilities are 9 then 8, 7, etc.
 $9 + 8 + 7 + 6 + 5 + 4 + 3 + 2 + 1 = 45$
 There are **45** whole numbers between 100 and 999 that have 9 as the sum of their digits.

2.1

31. **Hint:** What fraction of all numbers are divisible by 7?
Solution: $400 \div 7 = 57.14 \dots$
 $7 \times 1 = 7$
 $7 \times 2 = 14$
 \downarrow
 $7 \times 57 = 399$
 $7 \times 58 = 406$
 So **57** numbers between 1 and 400 are divisible by 7.

32. **Hint:** Look for a pattern in the last digit of the expansion of 6^n .
Solution: $6^2 = 6 \times 6 = 36$
 $6^3 = 6 \times 6 \times 6 = 216$
 $6^4 = 6 \times 6 \times 6 \times 6 = 1296$
 6 raised to any power will always create a 6 as the last digit of the expansion.
 The last digit of the expansion of 6^{30} is **6**.

33. **Hint:** Use trial and error. A table format may help.
Solution: Let p = number of pink rose plants,
 w = number of white rose plants
 Trials should consider that $p + w = 13$, and that $w > p$.

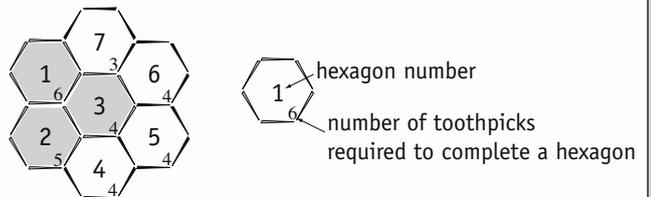
Trials	Pink rose plants		White rose plants		Total		Result
	p	cost	w	cost	plants	cost	
1	6	\$18	7	\$35	13	\$53	X
2	5	\$15	8	\$40	13	\$55	✓

The gardener bought **8** white plants.

2.2

31. **Hint:** Each number must be close to one fifth of 40.
Solution: Because $40 \div 5 = 8$
 Try 8 as the middle number in the sequence.
 Check: $6 + 7 + 8 + 9 + 10 = 40$
 The five consecutive numbers that add to 40 are **6, 7, 8, 9 and 10**.

32. **Hint:** Establish the number of toothpicks needed for 4, 5, 6 and 7 hexagons, so that you use the minimum number of toothpicks.
Solution: The first hexagon requires 6 toothpicks, the second one adds 5 toothpicks, and then, the third, fourth, fifth and sixth hexagons add 4 more toothpicks each. The seventh hexagon adds only 3 toothpicks in an arrangement as shown.



$3 + 4 + 4 + 4 = 15$
 The minimum number of extra toothpicks required to extend the pattern to seven hexagons is **15**.

33. **Hint:** Calculate the interest one year at a time. Work on the new balances achieved after each year's interest payment (Compound Interest).
Solution:
 At the end of the first year:
 $\$3000 + 10\% \text{ of } \$3000 = \$3000 + \$300 = \$3300$
 At the end of the second year:
 $\$3300 + 10\% \text{ of } \$3300 = \$3300 + \$330 = \$3630$
 At the end of the third year:
 $\$3630 + 10\% \text{ of } \$3630 = \$3630 + \$363 = \$3993$
 At the end of the third year Madeline's balance is **\$3993**.

31. **Hint:** Make a systematic list in table format. Start with the largest coin and work backwards.

Solution:

# of ways	50¢	20¢	5¢
1	50 + 50		
2	50	20 + 20	5 + 5
3	50	20	5 + 5 + 5 + 5 + 5 + 5
4	50		5 + 5 + 5 + 5 + 5 + 5 + 5 + 5
5		20 + 20 + 20 + 20 + 20	
6		20 + 20 + 20 + 20	5 + 5 + 5 + 5
7		20 + 20 + 20	5 + 5 + 5 + 5 + 5 + 5 + 5 + 5
8		20 + 20	5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5
9		20	5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5
10			5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5

If you have 5¢, 20¢ and 50¢ coins, you can make up \$1 in 10 ways.

32. **Hint:** Make organised lists.

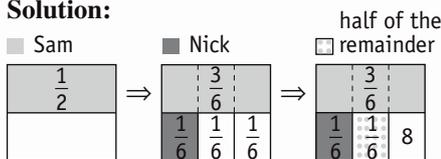
Solution: Let T and K represent the number of trees and kittens respectively.

<p>Fact 1</p> <p>If one kitten climbs each tree, there is one kitten without a tree. Some possibilities are:</p> <table border="1" style="width: 100%;"> <thead> <tr> <th></th> <th>Total</th> </tr> </thead> <tbody> <tr> <td></td> <td>(2K, 1T)</td> </tr> <tr> <td></td> <td>(3K, 2T)</td> </tr> <tr> <td></td> <td>(4K, 3T)</td> </tr> </tbody> </table>		Total		(2K, 1T)		(3K, 2T)		(4K, 3T)	<p>Fact 2</p> <p>If two kittens climb each tree, there is one unoccupied tree. Some possibilities are:</p> <table border="1" style="width: 100%;"> <thead> <tr> <th></th> <th>Total</th> </tr> </thead> <tbody> <tr> <td></td> <td>(2K, 2T)</td> </tr> <tr> <td></td> <td>(4K, 3T)</td> </tr> <tr> <td></td> <td>(6K, 4T)</td> </tr> </tbody> </table>		Total		(2K, 2T)		(4K, 3T)		(6K, 4T)
	Total																
	(2K, 1T)																
	(3K, 2T)																
	(4K, 3T)																
	Total																
	(2K, 2T)																
	(4K, 3T)																
	(6K, 4T)																

There is one option that fits both conditions.
There are 3 trees and 4 kittens.

33. **Hint:** Draw a diagram.

Solution:



Half of the remainder is $\frac{1}{6}$

$\frac{1}{6}$ of bowl = 8 M&Ms

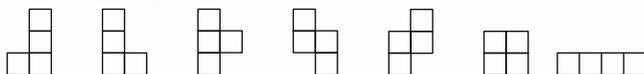
so $\frac{6}{6} = 8 \times 6 = 48$ M&Ms

Originally there were 48 M&Ms.

2.4

31. **Hint:** Make a model. Use trial and error.

Solution: When each square shares at least one side, the following shapes can be made:



In the Tetris game there are 7 different shapes.

32. **Hint:** Use trial and error. A table format may help.

Solution:

Trials should consider that the number of boys and girls add to 23.

There are at least four girls at the party, Deena, Chloe, Moira and Anna.

There are at least nine boys, given that Moira danced with 8 boys and Anna, who is the last girl considered, danced with all the boys.

Four girls and nine boys do not add up to 23 students, so the rest of the trials are shown in the table below.

Trials	Girls	Boys	Total
1	5	10	15
2	6	11	17
3	7	12	19
4	8	13	21
5	9	14	23

There are 14 boys at the party.

33. **Hint:** Draw a diagram and consider the different positions of the smaller cubes within the big cube.

Solution: The small cube hidden inside the big cube is not painted.

The cubes positioned in the middle of the six faces of the big cube are painted only on one side.

The cubes positioned in the middle of the 12 edges of the big cube are painted on two faces.

The cubes positioned at the 8 corners of the big cube are painted on three faces.

Interior cube (1)	Cube inside a face (6)	Cubes inside an edge (12)	Corner cubes (8)
0 painted faces	1 painted face	2 painted faces	3 painted faces

So 6 small cubes are painted on only one face.

2.5

31. **Hint:** Consider multiples of 9 and 10. Use trial and error.

Solution: One lolly has to be more than \$1.10, given that ten lollies cost more than \$11.

$\$1.10 \times 10 = \11

If one lolly costs \$1.15, then 9 lollies cost

$\$1.15 \times 9 = \10.35 , which is more than \$10 (incorrect)

If one lolly costs \$1.12, then 9 lollies cost

$\$1.12 \times 9 = \10.08 , which is more than \$10 (incorrect)

The only price left between \$1.10 and \$1.12 is \$1.11

$\$1.11 \times 9 = \9.99 , which is less than \$10 (correct)

Each lolly costs \$1.11.

2.5 (cont.)

32. **Hint:** What number must be added to our number so it becomes divisible by 2, 3, 4, 5, 6 and 7?

Solution: Our number minus 1 is divisible by 2, 3, 4, 5, 6 and 7. The smallest number with this property is the lowest common multiple of 2, 3, 4, 5, 6 and 7.

$$\text{LCM} = 2^2 \times 3 \times 5 \times 7 = 420$$

$$\text{Our number is } 420 + 1 = 421$$

Alex had **421** coins.

33. **Hint:** Which squares can be used? Use trial and error.

Solution: Start with the largest possible squares, then work down:

$$7^2 = 49 \quad 3^2 = 9$$

$$6^2 = 36 \quad 2^2 = 4$$

$$5^2 = 25 \quad 1^2 = 1$$

$$4^2 = 16$$

Try combinations of up to four squares:

$$7^2 + 3^2 + 1^2 + 1^2 = 49 + 9 + 1 + 1 = 60$$

$$7^2 + 2^2 + 2^2 + 2^2 = 49 + 4 + 4 + 4 = 61$$

$$6^2 + 5^2 = 36 + 25 = 61$$

$$6^2 + 4^2 + 3^2 = 36 + 16 + 9 = 61$$

$$5^2 + 4^2 + 4^2 + 2^2 = 25 + 16 + 16 + 4 = 61$$

By trial and error we find the only solutions are:

$$61 = 7^2 + 2^2 + 2^2 + 2^2$$

$$61 = 6^2 + 5^2$$

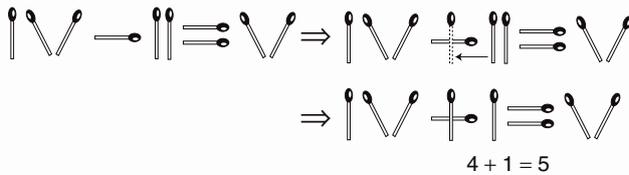
$$61 = 6^2 + 4^2 + 3^2$$

$$61 = 5^2 + 4^2 + 4^2 + 2^2$$

2.6

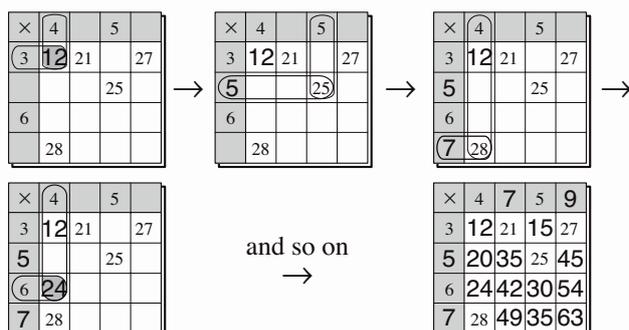
31. **Hint:** Make a model. Use trial and error.

Solution: A possible solution is:



32. **Hint:** The multiplication table has the numbers to be multiplied in the first row and the first column. Their products go in the corresponding intersecting spaces. Look for products where 2 of these 3 facts are known.

Solution:



33. **Hint:** Draw a table to help your reasoning, showing the 3 women, 3 men, 3 modes of transportation and 3 destinations. Use ✓ to mark a true statement and ✗ to mark a false one.

Solution: From the given facts we can immediately put into the table below:

- Eugene was seen at the *Stake Out* (✓) and therefore not at *Rainbo IV* (✗) or *Water World* (✗) and not in a limousine (✗).
- Belinda went to see *Rainbo IV* (✓) and therefore she wasn't at *Stake Out* (✗) or *Water World* (✗), and not with David (✗).
- Andrea travelled by taxi (✓) and therefore not by limousine (✗) or tandem bike (✗).
- Eugene and Flavian didn't ride the tandem bike (✗).

	David	Eugene	Flavian	Stake Out	Rainbo IV	Water World	taxi	limousine	tandem bike
Andrea							✓	✗	✗
Belinda	✗			✗	✓	✗			
Chloe									
taxi									
limousine		✗							
tandem bike		✗	✗						
Stake Out		✓							
Rainbo IV		✗							
Water World		✗							

So far, looking at the lines with 2 ✗s, we can reason that:

- Eugene travelled in a taxi. Andrea also travelled in a taxi. Eugene went to the *Stake Out*, so Andrea must have gone there too with Eugene.
- Flavian must have travelled by limousine with Belinda. These are the only possibilities left.
- Flavian and Belinda went to see *Rainbo IV*. So **Chloe and David** went to *Water World* on a **tandem bike**.

	David	Eugene	Flavian	Stake Out	Rainbo IV	Water World	taxi	limousine	tandem bike
Andrea		✓		✓			✓	✗	✗
Belinda	✗		✓	✗	✓	✗		✓	
Chloe	✓					✓			✓
taxi		✓							
limousine		✗	✓						
tandem bike	✓	✗	✗						
Stake Out		✓							
Rainbo IV		✗	✓						
Water World	✓	✗							

2.7

31. Hint: Fraction means dividing the numerator by the denominator. Consider the results when dividing 17 by each of the given numbers.

Solution: When dividing 17 by 4 or 5, the results are greater than 3.

When dividing 17 by 6, the result is $2\frac{5}{6}$ which is close to 3. When dividing 17 by 7, the result is $2\frac{3}{7}$ and when dividing 17 by 8, the result is $2\frac{1}{8}$

Of these two results, $2\frac{3}{7}$ is the closest to $2\frac{1}{2}$

The result closest to $2\frac{1}{2}$ is $\frac{17}{7}$

32. Hint: Starting at 1, eliminate the double of every number that is not crossed out.

Solution: Cross out number 2 (the double of 1), then 6 (the double of 3), then 8 (the double of 4) and so on.

Work through the list eliminating the double of any number that has not been crossed out. When you get to an eliminated number, ignore it!

1 ~~2~~ 3 4 5 ~~6~~ 7 ~~8~~
 9 ~~10~~ 11 12 13 ~~14~~ 15 16
 17 ~~18~~ 19 20 21 ~~22~~ 23 ~~24~~

There are a variety of combinations possible.

For example you could cross out 3 and 12 and leave 6 and 24 revealed.

You must however cross out **8** numbers.

33. Hint: Establish the relationship between the number of terms in a sequence and its average value:

For sequences with an odd number of terms the average value is the middle term.

e.g. For 7, 8, 9 Average = $\frac{7+8+9}{3} = 8$

For sequences with an even number of terms the average value ends in 0.5

e.g. For 5, 6, 7, 8 Average = $\frac{5+6+7+8}{4} = 6.5$

Solution: Average value = $\frac{\text{sum of all terms}}{\text{number of terms}}$

Number of terms	Average value (middle term)	Sequence
2	$\frac{75}{2} = 37.5$	37, 38
3	$\frac{75}{3} = 25$	24, 25, 26
4	$\frac{75}{4} = 18.75$	doesn't end in 0.5
5	$\frac{75}{5} = 15$	13, 14, 15, 16, 17
6	$\frac{75}{6} = 12.5$	10, 11, 12, 13, 14, 15
7	$\frac{75}{7} = 10.71\dots$	not a whole number
8	$\frac{75}{8} = 9.375$	doesn't end in 0.5
9	$\frac{75}{9} = 8.33\dots$	not a whole number
10	$\frac{75}{10} = 7.5$	3, 4, 5, 6, 7, 8, 9, 10, 11, 12

The other four sequences of consecutive numbers that add to 75 start with **3, 10, 24 & 37**.

2.8

31. Hint: Use trial and error. A table format may help.

Solution: Let x and y represent the two whole numbers. Trials should consider that $x + y = 166$

Trials	x	y	Difference	Result
1	100	66	$100 - 66 = 34$	X
2	99	67	$99 - 67 = 32$	✓

The two whole numbers are **99** and **67**.

32. Hint: Add all the numbers on the cake and divide by 3. This gives the sum of the numbers required for each piece.

Solution: $45 \div 3 = 15$

So each piece must add to 15.

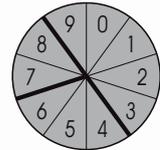
By trial and error:

$7 + 8 = 15$

$9 + 0 + 1 + 2 + 3 = 15$

$4 + 5 + 6 = 15$

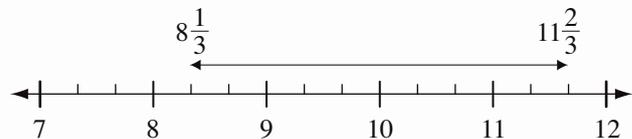
The largest piece was $\frac{5}{10}$ or $\frac{1}{2}$ of the cake.



33. Hint: Determine the average weight for the smallest and the largest fish. Use a number line.

Solution: The 3 largest fish weigh 35 kg altogether, so the average weight of the 3 largest fish is $11\frac{2}{3}$ kg.

The 3 smallest fish weigh 25 kg altogether, so the average weight for the 3 smallest fish is $8\frac{1}{3}$ kg.



NB: Given $100 - (35 + 25) = 40$ kg, the remaining 'middle weight fish', 40 kg in total, must each weigh within these averages. If any fish weigh less than $8\frac{1}{3}$ kg then they would be among the smallest. If any fish weigh more than $11\frac{2}{3}$ kg then they would be among the largest.

Now consider: How many fish can weigh 40 kg and be within this range?

By trial and error: You cannot have 3 fish making up the 40 kg because at least one would have to be larger than $11\frac{2}{3}$.

You cannot have 5 fish making up the 40 kg because at least one would have to be smaller than $8\frac{1}{3}$.

The only possible number of fish in this range is 4.

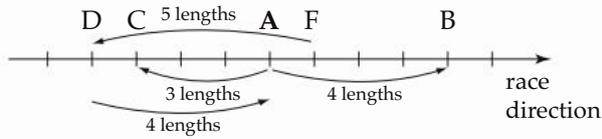
$\Rightarrow 3 + 3 + 4 = 10$

Barney caught **10** fish altogether.

3.1

31. Hint: Draw a diagram. Work around Alfie's position as he is mentioned three times.

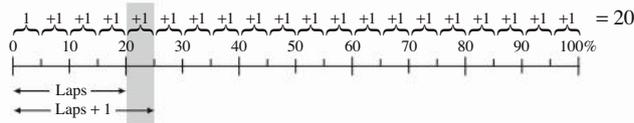
Solution: There are four pieces of information provided:
 (1) Alfie finished 3 lengths ahead of Charlie.
 (2) Alfie finished 4 lengths behind Bobby.
 (3) Dolly finished 4 lengths behind Alfie.
 (4) Flo finished 5 lengths ahead of Dolly.
 Flo's finishing position is **2nd**.



32. Hint: What percentage of the swim does 1 lap represent?

Solution: The difference between 25% and 20% of the total number of laps is 1 lap. So 5% equals 1 lap.

If $5\% = 1 \text{ lap}$
 then $5 \times 20 = 100\%$
 and $1 \times 20 = 20 \text{ laps}$



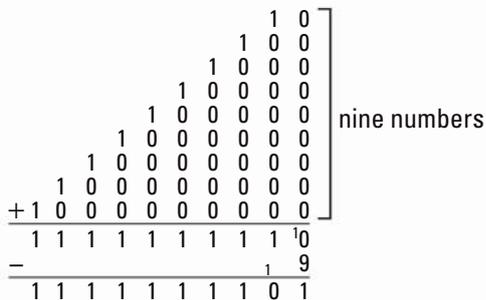
You must swim **20** laps in a day.

33. Hint: Think of 9 as $10 - 1$, 99 as $100 - 1$ and so on.

Solution: The sum $9 + 99 + 999 + 9999 + 99999 + \dots$ where the last number to be added consists of nine digits of 9 becomes:

$(10 - 1) + (100 - 1) + (1000 - 1) + (10000 - 1) + \dots$
 where the last multiple of 10 has nine zeros. There are nine pairs of brackets altogether.

Add the multiples of 10 first and then subtract 9:



Digit 1 appears **9** times in the answer.

3.2

3.1 - 3.2

31. Hint: A base 5 number can be written in expanded form using powers of 5 in the same way a base 10 number can be expanded using powers of 10.

Solution:

$$\begin{aligned} \text{If } 213_5 &= 2 \times 5^2 + 1 \times 5^1 + 3 \times 5^0 \\ \text{then } 310_5 &= 3 \times 5^2 + 1 \times 5^1 + 0 \times 5^0 \\ &= 3 \times 25 + 1 \times 5 + 0 \times 1 \\ &= 75 + 5 \\ &= 80 \end{aligned}$$

310_5 equals **80** in base 10.

32. Hint: Begin with the left column. Use trial and error.

Solution: The only digits that can be placed in the middle of the left column are 6 and 9. If 6 is used, 0 has to be above it. (impossible, as 0 is not allowed)

0	-		-		-6
-		×		+	
6	-		÷		7
÷		+		+	
3	+		+		16
-2		47		12	

So the left column must be $1 - 9 \div 3 = -2$

Column 2 can only be $5 \times 8 + 7 = 47$

or $7 \times 6 + 5 = 47$

Row 2 can now only be $9 - 8 \div 4 = 7$

or $9 - 4 \div 2 = 7$

This means 8 must go in the centre of the puzzle.

The final solution is:

1	-	5	-	2	-6
-		×		+	
9	-	8	÷	4	7
÷		+		+	
3	+	7	+	6	16
-2		47		12	

33. Hint: List the possibilities and look for a pattern.

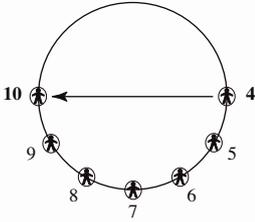
Solution:

	00	10	20	30	40	50	60	70	80	90	Total
01	11	21	31	41	51	61	71	81	91	1	2
02	12	22	32	42	52	62	72	82	92	3	3
03	13	23	33	43	53	63	73	83	93	4	4
04	14	24	34	44	54	64	74	84	94	5	5
05	15	25	35	45	55	65	75	85	95	6	6
06	16	26	36	46	56	66	76	86	96	7	7
07	17	27	37	47	57	67	77	87	97	8	8
08	18	28	38	48	58	68	78	88	98	9	9
09	19	29	39	49	59	69	79	89	99	10	10

The maximum number of telephone numbers this town could have is **55**.

31. **Hint:** Draw a diagram.

Solution: There are 5 students between the 4th and the 10th students no matter which way you go.
So $5 + 5 = 10$.
Then include the 4th and the 10th students.
There are **12** students evenly spaced around the circle.



32. **Hint:** Find the lowest common multiple of 68 and 72.

Solution: If the taps drip together at exactly 1:00 pm, then the next time they drip together again needs to be after an exact amount of 68-second and 72-second intervals.
The smallest number that divides evenly to 68 and 72 is their lowest common multiple (LCM).
To find the LCM of 68 and 72 write their multiples in ascending order:

multiples of 68: 68, 136, 204, 272, 340, 408, 476, 544, 612, 680, 748, 816, 884, 952, 1020, 1088, 1156, 1224, 1292, ...

multiples of 72: 72, 144, 216, 288, 360, 432, 504, 576, 648, 720, 792, 864, 936, 1008, 1080, 1152, 1224, 1296, ...
The LCM of 68 and 72 is 1224.

$1224 \text{ seconds} = 1224 \div 60 = 20 \text{ minutes } 24 \text{ seconds}$
Add 20 min 24 seconds to 1:00 pm and the next time the taps drip together at the same time is **1:20.24 pm**
OR

To find the LCM of 68 and 72 write the numbers as a product of their prime factors:
 $68 = 2^2 \times 17$
 $72 = 2^3 \times 3^2$
The LCM of 68 and 72 is $2^3 \times 3^2 \times 17 = 72 \times 17 = 1224$

33. **Hint:** Start with what you know. Work systematically. Use trial and error.

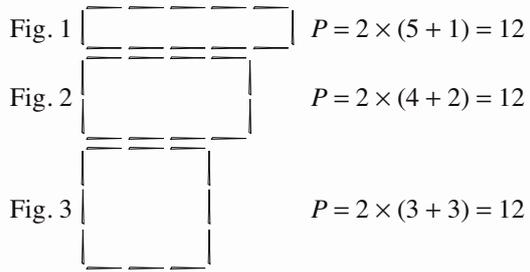
Solution:

Guess	Secret Number	Cows	Bulls
1st	1 6 2	-	1
2nd	1 7 5	1	1
3rd	1 6 5	1	-

The digits 1 and 6 are in the same positions in guesses 1 and 3, where there is only 1 bull and 1 cow respectively. Therefore 1 and 6 cannot be part of the solution. The only digits left are 2, 5 and 7.
1 bull in the first guess indicates that 2 is in the correct position, in the right hand side column.
1 cow in the third guess indicates that 5 is not in the correct position, which leaves 7 in the correct position, in the middle column.
The secret number is **572**.

31. **Hint:** Draw a diagram or make a model.

Solution: Start with a side length of 1 toothpick, which was the example given, and increase the side length by 1 each time until all possibilities are checked.



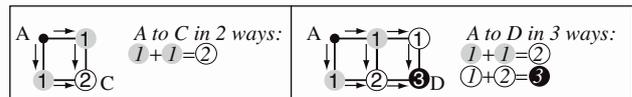
The next diagram in the pattern would only be a rotation of figure 2.

You can make **3** different rectangles using 12 toothpicks.

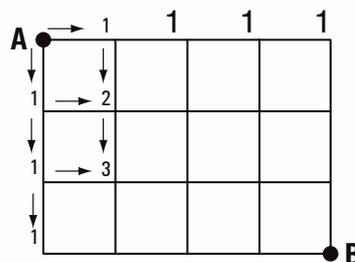
32. **Hint:** Think about how many presents each child needs to give away.

Solution: Each of the five children must give a present to other four children, which makes a total of $5 \times 4 = 20$.
Mrs Nicholas must buy **20** presents altogether.

33. **Hint:** Look for a pattern working one intersection at a time from A. Consider the simpler problems first:

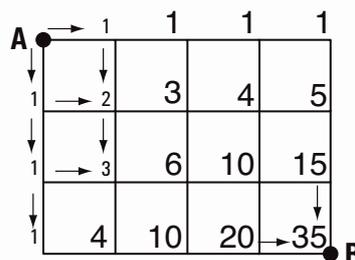


Solution: Working from A, consider all the points on the grid that give only one possible path to that intersection. Mark them with 1.



Use this pattern to establish the rule for finding the number of paths from A to any intersection on the grid: 'Add the number of paths from the intersections immediately up and left.'

Apply this rule to every intersection on the grid until you reach B.



The final addition at intersection B is: $15 + 20 = 35$
Moving from A to B you can go on **35** different paths.

- 31. Hint:** Find common multiples of 3, 4 and 5.
Solution: Common multiples of 3, 4 and 5 in ascending order are: 60, 120, 180, 240, etc.
 To fulfil the condition of the number leaving a remainder of 2 when divided by 3, 4 or 5, we need to add 2 to each of these common multiples:
 62, 122, 182, 242, etc.
 The smallest positive integer is **62**.
- 32. Hint:** Think about the sum of the numbers when the average is given.
Solution: Given their average is 10, the sum of the six numbers would need to be $6 \times 10 = 60$
 The sum of the given five numbers is:
 $5 + 8 + 12 + 15 + 17 = 57$
 Therefore the sixth number must be the difference between 60 and 57: $60 - 57 = 3$
 The sixth number is **3**.
- 33. Hint:** Exclude the silver and bronze medal winners to find the gold medal winner.
Solution: From the given facts we can immediately reason that:
- The silver medal winner from New Zealand told Flame that it was her 18th birthday, so Flame cannot be the silver medal winner from New Zealand, who turned 18.
 - June is from China and she is 14 years old. Therefore Crystal must be the 18 year old, silver medal winner from New Zealand. This leaves Flame as the 16 year old bronze medal winner.
 So **June from China** is the gold medal winner.

3.6

- 31. Hint:** Place the largest digits in the tens place and the smallest digits in the units place. Use trial and error.
Solution:

$$\begin{array}{r}
 7,5 \\
 \downarrow \downarrow \\
 \square \square \\
 \times \square \square \\
 \hline
 \end{array}$$

There are two combinations to try

$$\begin{array}{r}
 73 \\
 \times 51 \\
 \hline
 73 \\
 3650 \\
 \hline
 3723
 \end{array}
 \qquad
 \begin{array}{r}
 71 \\
 \times 53 \\
 \hline
 213 \\
 3550 \\
 \hline
 3763
 \end{array}$$

The largest possible answer is

$$\begin{array}{r}
 \boxed{7} \boxed{1} \\
 \times \boxed{5} \boxed{3} \\
 \hline
 213 \\
 3550 \\
 \hline
 \boxed{3763}
 \end{array}$$

- 32. Hint:** How many 1 cm cubes are necessary to build a hollow cube of a given side length? Look for a pattern.
 Draw a table of results.
Solution: We know that:
 In a solid 3 cm cube there are $3^3 = 27$ cubes of side length 1 cm.
 Of these cubes, 1 cube ($1^3 = 1$) is hidden, so the difference of **26** cubes is necessary to build a hollow cube of side length 3 cm.
 In a solid 4 cm cube there are $4^3 = 64$ cubes of side length 1 cm.
 Of these cubes, 8 cubes ($2^3 = 8$) are hidden, so the difference of **56** cubes is necessary to build a hollow cube of side length 4 cm.
 A pattern emerges: the power that gives the number of hidden cubes has a base two less than the base of the power that gives the total number of cubes in the block.
 We know that there are 1000 small cubes available by cutting the 10 cm cube into 1 cm cubes.
 By completing the table shown, we will find the number of small cubes used to build the largest possible hollow cube without exceeding the 1000 cubes available.

Side of the solid cube (cm)	Total number of 1 cm cubes	Hidden cubes	Number of 1 cm cubes to build a hollow cube
5	$5^3 = 125$	$3^3 = 27$	$125 - 27 = 98$
6	$6^3 = 216$	$4^3 = 64$	$216 - 64 = 152$
7	$7^3 = 343$	$5^3 = 125$	$343 - 125 = 218$
8	$8^3 = 512$	$6^3 = 216$	$512 - 216 = 296$
9	$9^3 = 729$	$7^3 = 343$	$729 - 343 = 386$
10	$10^3 = 1000$	$8^3 = 512$	$1000 - 512 = 488$
11	$11^3 = 1331$	$9^3 = 729$	$1331 - 729 = 602$
12	$12^3 = 1728$	$10^3 = 1000$	$1728 - 1000 = 728$
13	$13^3 = 2197$	$11^3 = 1331$	$2197 - 1331 = 866$
14	$14^3 = 2744$	$12^3 = 1728$	$2744 - 1728 = 1016$

So the largest hollow cube that can be made by gluing together 1 cm cubes has a side of 13 cm and it requires 866 small cubes.

$$1000 - 866 = 134$$

Of the original 1 cm cubes, **134** are NOT used to make this larger cube.

3.6 (cont.)



33. **Hint:** Use a number coded diagram. Write the results in a table.

Solution: Number the rectangles inside the diagram as shown. Two or more of these rectangles can be grouped to make bigger rectangles. List all possible combinations of rectangles.



Rectangle 1	Rectangle 2	Rectangle 3
1	2	3
1 + 6	2 + 3 + 4	3 + 4
1 + 2 + 3 + 4	2 + 3 + 4 + 5	3 + 8
1 + 2 + 3 + 4 + 5	2 + 3 + 4 + 8 + 9	3 + 4 + 8 + 9
1 + 2 + 3 + 4 + 6 + 7 + 8 + 9	2 + 3 + 4 + 7 + 8 + 9	3 + 4 + 7 + 8 + 9
outer rectangle	2 + 3 + 4 + 5 + 7 + 8 + 9 + 10	
Rectangle 4	Rectangle 5	Rectangle 6
4	5	6
4 + 9	5 + 10	6 + 7 + 8 + 9
		6 + 7 + 8 + 9 + 10
Rectangle 7	Rectangle 8	Rectangle 9
7	8	9
7 + 8 + 9	8 + 9	
7 + 8 + 9 + 10		
Rectangle 10		
10		

There are **31** rectangles in the diagram.

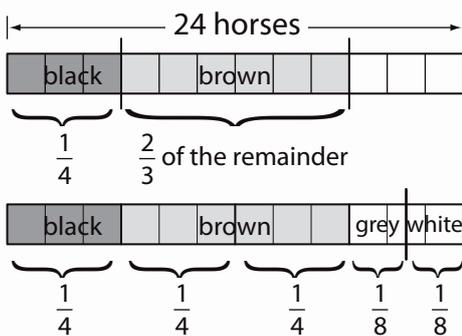
3.7

31. **Hint:** Calculate the number of black horses first, then the number of brown horses. OR Draw a diagram.

Solution:
 black horses: one quarter of 24 = $\frac{1}{4} \times 24 = 6$ horses
 $\Rightarrow 24 - 6 = 18$ remainder
 brown horses: two thirds of 18 = $\frac{2}{3} \times 18 = 12$ horses
 $\Rightarrow 18 - 12 = 6$ remainder
 grey horses: half of 6 = 3 horses
 white horses: half of 6 = 3 horses

OR

Divide a rectangle into 12 equal parts and represent the fractions:

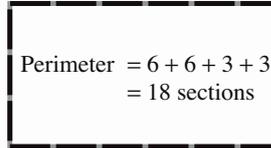


$\frac{1}{8}$ of 24 = 3

So **3** horses are white.

32. **Hint:** Look for a pattern. Establish the relationship between the number of sections and the number of posts and rails required to build the fence. A table format may help.

Solution: To build a fence around a rectangular yard, which is 6 sections long and 3 sections wide, the fence has a perimeter of 18 sections.



Every new section adds 1 post and 2 rails to the fence.



sections	3	4	5	6	7	17	18
posts	4	5	6	7	8	18	19
rails	6	8	10	12	14	34	36

The patterns that emerge from completing the table are:
 - the number of posts is 1 greater than the number of sections
 - the number of rails is twice the number of sections

However, due to the fact that the post of the last section overlaps with the first post of the fence in order to close the rectangle, there are $19 - 1 = 18$ posts.

There are **18** posts and **36** rails around the rectangular yard.

33. **Hint:** Found on a grade 3 test implies that there is nothing tougher than +, -, × or ÷

Solution: All three numbers in each equation add to 12:

$$5 + 3 + 4 = 12 \quad 5 + 1 + 6 = 12$$

$$2 + 8 + 2 = 12 \quad 6 + 3 + 3 = 12$$

We can write a general formula for this case:

$$a * b = 12 - (a + b)$$

(* means - What number must be added to these 2 numbers to make 12?)

Then $1 * 7 = 12 - (1 + 7)$

$$1 * 7 = 4$$

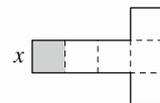
The challenge answer is **4**.

3.8

31. **Hint:** Use the formulae for the area of a square and the perimeter of a shape.

Solution: Let x be the side length of any of the six congruent squares.

$$\begin{aligned} \text{Area square} &= \text{length} \times \text{length} \\ &= x \times x \\ &= x^2 \end{aligned}$$



The total area of the shape is the sum of the areas of six congruent squares:

$$6x^2 = 150$$

$$x^2 = 25$$

$$x = 5 \text{ cm}$$

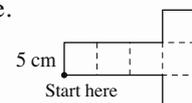
To find the perimeter of the shape count the side lengths of 5 cm moving around the shape.

There are 14 lengths of 5 cm.

$$P = 14 \times 5 \text{ cm}$$

$$= 70 \text{ cm}$$

The perimeter of the shape is **70** cm.



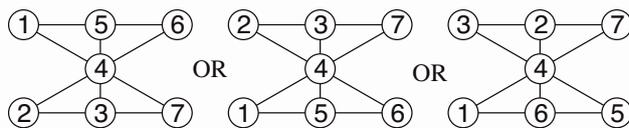
3.8 (cont.)

32. Hint: Make an organised list of all possible combinations of three different digits from 1 to 7 that add to 12. Think about the best number to put in the centre given these combinations.

Solution: Using the digits from 1 to 7, the possible combinations of three different numbers that add to 12 are:

- (1,4,7) → 1 + 4 + 7 = 12
- (1,5,6) → 1 + 5 + 6 = 12
- (2,3,7) → 2 + 3 + 7 = 12
- (2,4,6) → 2 + 4 + 6 = 12
- (3,4,5) → 3 + 4 + 5 = 12

Since 4 is the most used number, try 4 in the centre of the diagram where the 3 lines cross. There are a variety of solutions. Three solutions are shown below:



33. Hint: Draw a Venn diagram.

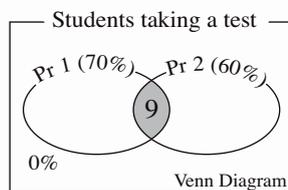
Solution: 70% solved the first problem and 60% solved the second problem.

$$70\% + 60\% = 130\%$$

So 30% of students solved both problems and, since every student solved at least one, it represents 9 students. If 9 students represent 30% of the total, then 10% is three times less: $9 \div 3 = 3$

If 10% of the total number of students is 3, then 100% is ten times more: $3 \times 10 = 30$

So **30** students took the test.



4.1

31. Hint: Use logic.

Solution: In guaranteeing that at least one of the 2 lawyers in any random selection was crooked, then there can only be 1 honest lawyer in the whole 100, otherwise there is the possibility of choosing 2 honest lawyers at any one time.

There was **1** honest lawyer present.

32. Hint: Choose a fictitious but simple price to work on. Complete one discount at a time.

Solution: Using a \$100 item, find the 50% discount first.

Discount 1: We know 50% of \$100 = \$50.

The item now costs \$50.

Discount 2: 30% of \$50

$$= \frac{30}{100} \times \frac{50}{1}$$

$$= \$15$$

So the total discount on a \$100 item is \$50 + \$15 = \$65

\$65 is 65% of a \$100 item.

The single discount equivalent to successive discounts of 30% and 50% is **65%**.

33. Hint: Make an organised list. The order must be considered, e.g. five scores of 3 and one score of 1 generate six different ways of scoring 16.

Solution: The only possible six score combinations to add to 16 are:

3, 3, 3, 3, 3 and 1 in various positions

3, 3, 3, 3, 2 and 2 in various positions.

No other six score combination of 0, 1, 2 or 3 to add to 16 is possible.

NB The 3's have been omitted from the table (but would have been in all of the empty spaces), so the patterns of 1's and 2's are visible.

	Q1	Q2	Q3	Q4	Q5	Q6	Total
Trials	marks						
1						1	16
2					1		16
3				1			16
4			1				16
5		1					16
6	1						16
7					2	2	16
8				2	2		16
9			2	2			16
10		2	2				16
11	2	2					16
12	2					2	16
13				2		2	16
14			2		2		16
15		2		2			16
16	2		2				16
17	2				2		16
18		2				2	16
19			2			2	16
20		2			2		16
21	2			2			16

There are **21** ways a student can score 16 in six questions.

31. **Hint:** Use guess and check with numbers divisible by 3. A table format may help. OR Use algebra.

Solution:

Trial	Age (years)		
	Miriam	Miriam (+ 3)	75 (+ Miriam)
1	3	1	25
2	6	2	12.5
3	9	3	8.3
4	12	4	6.25
5	15	5	5

OR Algebraically, let M represent Miriam's age.

$$\frac{M}{3} = \frac{75}{M} \quad \text{cross multiply}$$

$$M^2 = 75 \times 3$$

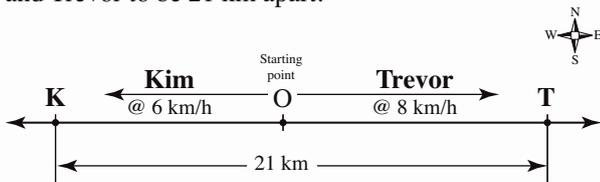
$$M = \sqrt{225}$$

$$M = 15$$

Miriam is 15 years old.

32. **Hint:** Distance travelled = Speed \times Time At what speed are they moving apart? Draw a diagram.

Solution: Let t represent the running time taken for Kim and Trevor to be 21 km apart.



Kim and Trevor are moving away from each other at

$$6 + 8 = 14 \text{ km/h.}$$

Using Distance travelled = Speed \times Time

$$21 = 14 \times t$$

$$t = \frac{21}{14} \text{ hours}$$

$$t = 1.5 \text{ hours}$$

So 1.5 hours after noon Kim and Trevor are 21 km apart.

At **1:30 pm** Kim and Trevor will be 21 km apart.

33. **Hint:** Start with the M and A. Work at the units column first. Use trial and error.

Solution: The relevant hints from the GOD clue are:

$G = 6, O = 0$ and $D = 5$ (6, 0 and 5 won't be reused.)

$$\begin{array}{r} \text{A D A M} \\ \text{AND} \\ + \text{E V E} \\ \hline \text{M O V E D} \end{array} \Rightarrow \begin{array}{r} \text{A 5 A M} \\ \text{A N 5} \\ + \text{E V E} \\ \hline \text{M 0 V E 5} \end{array}$$

At a glance we can determine:

Tens of thousands: $M = 1$, because these three numbers cannot add to more than 1 tens of thousand.

Thousands: $A = 8$ or 9 because $8 + 2$ carried over from the hundreds or $9 + 1$ carried over from the hundreds must end in 0, and A cannot be 0.

If $A = 8$

$$\begin{array}{r} 8 \ 5 \ 8 \ 1 \\ 8 \ N \ 5 \\ + \ E \ V \ E \\ \hline 1 \ 0 \ V \ E \ 5 \end{array}$$

Units: $1 + 5 + E$ ends in 5 leads to $E = 9$, which then excludes the other possibility for A.

so $E = 9$

$$\begin{array}{r} 2 \ 1 \ 1 \\ 8 \ 5 \ 8 \ 1 \\ 8 \ N \ 5 \\ + \ 9 \ V \ 9 \\ \hline 1 \ 0 \ V \ 9 \ 5 \end{array}$$

Tens: $8 + N + V + 1$ carried over ends in 9.

$N + V$ must end in 0, and the only pair which can be used is (3,7), because $G = 6$ so 6 and 4 are not possible.

In this case only 1 can be carried over to the hundreds, because the result of the addition is 19.

Hundreds: $5 + 8 + 9 + 1$ carried over ends in V.

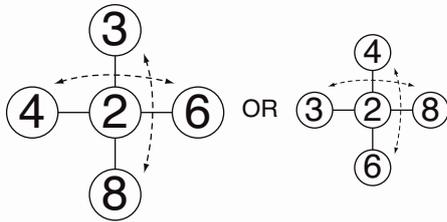
So $V = 3$ and 2 is carried over to the thousands.

$$\begin{array}{r} 2 \ 1 \ 1 \\ 8 \ 5 \ 8 \ 1 \\ 8 \ 7 \ 5 \\ + \ 9 \ 3 \ 9 \\ \hline 1 \ 0 \ 3 \ 9 \ 5 \end{array}$$

MOVED represents **10395**.

4.3

- 31. Hint:** What number is best placed in the centre?
Solution: The central number will be used in both products so make it as small as possible.
 If we use 2, then 3, 4, 6 and 8 are available for the other circles.
 $3 \times 8 = 4 \times 6 = 24$, so we have the solution.



- 32. Hint:** Make a systematic list in table format. In how many ways can three numbers that are ≥ 3 and add to 12 be arranged? The order in each combination must be considered.

Solution: There are 12 coins shared between the three children and each receives at least 3 coins.
 The only triplets of numbers ≥ 3 that add to 12 are:
 (3, 3, 6) (3, 4, 5) and (4, 4, 4)

Number of ways	Josh	Frank	Suzie
1	3	3	6
2	3	6	3
3	6	3	3
4	3	4	5
5	3	5	4
6	4	3	5
7	4	5	3
8	5	3	4
9	5	4	3
10	4	4	4

If each of them receive at least 3 coins, there are **10** ways in which 12 coins can be shared between Josh, Frank and Suzie.

- 33. Hint:** Distance travelled = Speed \times Time
Solution: In 6 hours Sandra walked up the hill at 2 km/h and down the hill at 4 km/h.

It will then take twice as long to walk up the hill as it would to walk down.

So $\frac{2}{3}$ of the time was spent going up the hill

$$\frac{2}{3} \times 6 = 4 \text{ h}$$

and $\frac{1}{3}$ of the time was spent going down the hill.

$$\frac{1}{3} \times 6 = 2 \text{ h}$$

Use 4 hours at 2 km/h or 2 hours at 4 km/h

$$\begin{aligned} D &= \text{speed} \times \text{time} \\ &= 2 \times 4 \\ &= 8 \text{ km} \end{aligned}$$

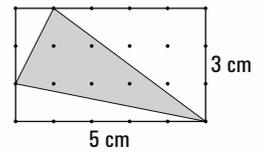
It is **8** km to the top of the hill.

4.4

4.3 - 4.4

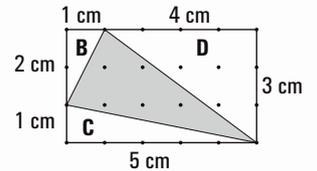
- 31. Hint:** Use the grid to calculate the area of the right-angled triangles around the shaded triangle.

Solution: The rectangle around the shaded triangle has length = 5 cm and width = 3 cm
 Area rectangle = length \times width
 $= 5 \times 3$
 $= 15 \text{ cm}^2$



$$\begin{aligned} \text{Area triangle B} &= \frac{1}{2} \times \text{base} \times \text{height} \\ &= \frac{1}{2} \times 1 \times 2 \\ &= 1 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{Area triangle C} &= \frac{1}{2} \times 5 \times 1 \\ &= 2 \frac{1}{2} \text{ cm}^2 \end{aligned}$$



$$\begin{aligned} \text{Area triangle D} &= \frac{1}{2} \times 2 \times 3 \\ &= 6 \text{ cm}^2 \end{aligned}$$

The area of the shaded triangle is the difference between the area of the rectangle and the area of triangles B, C, D:

$$\begin{aligned} \text{Area shaded triangle} &= 15 - 1 - 2 \frac{1}{2} - 6 \\ &= 5 \frac{1}{2} \text{ cm}^2 \end{aligned}$$

The area of the triangle is $5 \frac{1}{2} \text{ cm}^2$.

- 32. Hint:** Use trial and error. A table format may help.

Solution: Let c = number of correct answers,
 i = number of incorrect answers

Trials should consider that $c + i = 10$, because there are 10 questions in the maths test.

Trials	Correct answers		Incorrect answers		Total		Result
	c	points	i	points	questions	points	points
1	5	+50	5	-15	10	35	X
2	6	+60	4	-12	10	48	X
3	7	+70	3	-9	10	61	✓

Sue gave **7** correct answers.

4.4 (cont.)



4.4 - 4.6

33. **Hint:** How many steps to the top of the stationary escalator? What is the escalator's rate?

Solution: On Monday, Tom climbed the escalator which was not working. Tom's rate was 2 steps per second and because it took him 18 seconds to reach the top, it means that there are 36 steps visible on the escalator at any given time.

On Tuesday, Tom climbed the escalator which was working. Tom's rate was also 2 steps per second and because it took him 12 seconds to reach the top, it means he only climbed 24 steps. The remaining 12 steps moved in the same interval of 12 seconds. So the rate of the escalator is 1 step per second.

On Wednesday, Tom rode the escalator without climbing at all. The escalator has 36 steps.

36 steps at a rate of 1 step per second \Rightarrow 36 seconds.

On Wednesday it took Tom **36** seconds to reach the top.

33. **Hint:** First determine the rate for the tap and then the rate for the hose in tanks per minute.

Solution:

The tap works at a rate of $\frac{1}{6}$ tanks per minute.

The hose works at a rate of $\frac{1}{9}$ tanks per minute.

If both work together, their rate is:

$$\frac{1}{6} + \frac{1}{9} = \frac{5}{18} \text{ tanks per minute}$$

$\frac{5}{18}$ tanks per minute means $\frac{18}{5}$ minutes per tank.

$$\frac{18}{5} = 3\frac{3}{5} \text{ min} = 3 \text{ min} + \frac{3}{5} \times 60 \text{ s} = 3 \text{ min } 36 \text{ s}$$

It would take **3 min 36 s** if I used the tap and the hose.

4.5

31. **Hint:** List possible dimensions of the rectangles with a perimeter of 200 m. A table format may help.

Solution: The perimeter of the garden is 200 metres, so we have to find the length and the width that add to 100 m and have the largest possible product.

Trial	length	width	perimeter	Area $l \times w$
1	90	10	200	900
2	80	20	200	1600
3	70	30	200	2100
4	60	40	200	2400
5	50	50	200	2500

The products becomes larger and larger as the length and the width get closer to each other.

The best length and width of the garden is **50 m \times 50 m**.

32. **Hint:** Make a systematic list in table format. Use trial and error.

Solution: Trials should consider that Michelle has an equal number of 5¢, 10¢ and 20¢ coins, with a total of \$14.

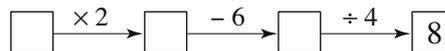
trial	5¢		10¢		20¢		total	result
	coins	sum	coins	sum	coins	sum		
1	20	\$1.00	20	\$2.00	20	\$4.00	\$7	X
2	30	\$1.50	30	\$3.00	30	\$6.00	\$10.50	X
3	40	\$2.00	40	\$4.00	40	\$8.00	\$14	✓

Michelle has 40 of each type which gives a total of **120** coins.

4.6

31. **Hint:** Work backwards and do the opposite. Draw a diagram.

Solution:



If at the end you divide by 4, then do the opposite and multiply by 4.

$$8 \times 4 = 32$$

Continue in this way. If you subtract 6 then add 6.

$$32 + 6 = 38$$

If you multiply by 2 then divide by 2.

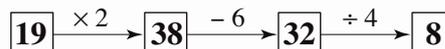
$$38 \div 2 = 19$$

Double check 19 as your result by working forwards.

$$19 \times 2 = 38$$

$$38 - 6 = 32$$

$$32 \div 4 = 8 \text{ (true)}$$



The original number is **19**.

32. **Hint:** Use trial and error. What must the original class size be a multiple of?

Solution: Trials should consider that the original class size is a multiple of 7 and that the final numbers of boys and girls are equal.

Trials	Original class size	Girls	Girls + triplets	New class size	Difference in class sizes	Result
1	35	$\frac{3}{7} \times 35 = 15$	18	$18 + 18 = 36$	$36 - 35 = 1$	X
2	28	$\frac{3}{7} \times 28 = 12$	15	$15 + 15 = 30$	$30 - 28 = 2$	X
3	21	$\frac{3}{7} \times 21 = 9$	12	$12 + 12 = 24$	$24 - 21 = 3$	✓

There are **24** students in the class now.

- 33. Hint:** Compare the faulty clock with the real time.
What is happening between 12 and 1 pm in real time?
Solution: The faulty clock gains 4 minutes every hour.
When 60 minutes have passed in real time, the faulty clock shows 64 minutes passing.

Faulty clock	Real time
9:00 am	9:00 am
10:04 am	10:00 am
11:08 am	11:00 am
12:12 pm	12:00 pm

+ 64 min { } + 60 min
+ 64 min { } + 60 min
+ 64 min { } + 60 min

At this point we can no longer add 64 minutes and get to 1:00 pm. Consider that the ratio of faulty time to real time is 64:60 or 16:15.

Based on this ratio, the table can be continued.

12:28 pm	12:15 pm
12:44 pm	12:30 pm
1:00 pm	12:45 pm

+ 16 min { } + 15 min
+ 16 min { } + 15 min
+ 16 min { } + 15 min

When the clock shows 1:00 pm the correct time is **12:45 pm**.

4.7

- 31. Hint:** Look for a pattern for the number of zeros when raising 1000 to a power.

Solution:

$$1000^2 = 1000 \times 1000 = 1\,000\,000$$

$$\Rightarrow 6 \text{ zeros } (2 \times 3)$$

$$1000^3 = 1000 \times 1000 \times 1000 = 1\,000\,000\,000$$

$$\Rightarrow 9 \text{ zeros } (3 \times 3)$$

$$1000^4 = 1000 \times 1000 \times 1000 \times 1000 = 1\,000\,000\,000\,000$$

$$\Rightarrow 12 \text{ zeros } (4 \times 3)$$

$$1000^{2015} \text{ will have } 2015 \times 3 = 6045 \text{ zeros}$$

Therefore 1000^{2015} written in standard form consists of the digit 1 followed by 6045 zeros.

When 1000^{2015} is expressed as a numeral there are **6046** digits.

- 32. Hint:** Systematically add the number of digits scanned for all the one-, two- and three-digit numbers. Check the answer.

Solution:

There are 9 one-digit numbers from 1 to 9

$$\Rightarrow 9 \text{ digits to scan}$$

There are 90 two-digit numbers from 10 to 99

$$\Rightarrow 180 \text{ digits to scan}$$

There are 900 three-digit numbers from 100 to 999

$$\Rightarrow 2700 \text{ digits to scan}$$

The computer only scans 1392 digits, so the last number scanned must be a three-digit number.

After scanning all the one-digit and two-digit numbers

$$\Rightarrow 1392 - 9 - 180 = 1203 \text{ digits left to make the}$$

three-digit numbers scanned

$$\Rightarrow 1203 \div 3 = 401 \text{ numbers scanned}$$

Starting with 100, count 401 numbers:

$$100 \text{ to } 199 \Rightarrow 100 \text{ numbers}$$

$$200 \text{ to } 299 \Rightarrow 100 \text{ numbers}$$

$$300 \text{ to } 399 \Rightarrow 100 \text{ numbers}$$

$$400 \text{ to } 499 \Rightarrow 100 \text{ numbers}$$

$$\Rightarrow 400 \text{ numbers}$$

The 401th number is 500.

Therefore the last counting number scanned is **500**.

Checking the answer:

one-digit numbers from 1 to 9 $\Rightarrow 9$ digits

two-digit numbers from 10 to 99 $\Rightarrow 180$ digits

three-digit numbers from 100 to 500 $\Rightarrow 1203$ digits

$$\text{Total: } 9 + 180 + 1203 = 1392 \text{ (correct)}$$

- 33. Hint:** How many matches are played?

Remember that team A playing against team B and B playing against A counts as one match.

Solution: Each team plays 7 matches (a team cannot play against itself). Since there are 8 teams, it would seem that there are $7 \times 8 = 56$ matches, BUT because we don't count the doubles, there are 28 matches altogether.

Two points are awarded each match, thus a total of $28 \times 2 = 56$ points are available.

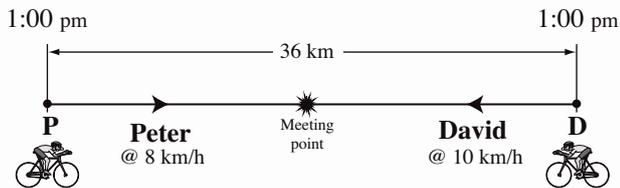
The worst scenario that can happen is that 5 teams dominate the competition, finishing equal on points, with your team missing the final four on percentage.

If 5 teams dominate, then the bottom 3 teams will only score points against each other. They play 3 matches against each other and will gain 6 points from those games. Of the 56 points 50 are left to be divided equally between the top 5 teams. This gives them 10 points each.

A team must score **11** points to be sure that it will finish in the top four.

31. **Hint:** $\text{Distance travelled} = \text{Speed} \times \text{Time}$.
At what speed are they moving toward each other?
Draw a diagram.

Solution: Let t represent the riding time taken for Peter and David to meet.



Peter and David move towards each other at a speed of $8 + 10 = 18$ km/h. They started 36 km apart.

Using $\text{Distance travelled} = \text{Speed} \times \text{Time}$

$$36 = 18 \times t$$

$$t = \frac{36}{18} \text{ hours}$$

$$t = 2 \text{ hours}$$

So, two hours later, Peter and David meet.

Peter and David leave their homes at 1:00 pm and meet at **3:00 pm**.

32. **Hint:** Write the expressions for the remaining consecutive numbers.

Solution: The difference between any two consecutive whole numbers is 1. Add 1 to get to the next consecutive number.

The consecutive whole numbers are:

$$n - 1$$

$$n - 1 + 1 = n$$

$$n + 1$$

$$n + 1 + 1 = n + 2$$

$$\text{So } n + n + n + n = 4n$$

The sum of the four consecutive whole numbers is

$$4n + 2.$$

33. **Hint:**

RULE 1

Odd number \times Even number = Even number

RULE 2

Odd number \times Odd number = Odd number

RULE 3

Even number + Odd number = Odd number

RULE 4

Odd number + Odd number = Even number

OR Test each case with an even and an odd number.

Solution: n is an integer, so it can be either even or odd.

According to the rules:

A) $3n$ can be either even or odd (RULES 1 & 2)

B) $n^2 + 3$ can be either even or odd (RULES 1, 2, 3, 4)

C) $n + 3$ can be either even or odd (RULES 3 & 4)

D) $2n^2 + 3$ is always an odd number (RULE 2)

So **D** must be an odd integer.

OR

Choose $n = 4$ and $n = 5$ to test each case and establish which case gives always an odd integer:

A) $3n = 3 \times 4 = 12$ (even) or

$$3n = 3 \times 5 = 15 \text{ (odd)}$$

B) $n^2 + 3 = 4 \times 4 + 3 = 19$ (odd) or

$$n^2 + 3 = 5 \times 5 + 3 = 28 \text{ (even)}$$

C) $n + 3 = 4 + 3 = 7$ (odd) or

$$n + 3 = 5 + 3 = 8 \text{ (even)}$$

D) $2n^2 + 3 = 2 \times 4 \times 4 + 3 = 35$ (odd) or

$$2n^2 + 3 = 2 \times 5 \times 5 + 3 = 53 \text{ (odd)}$$

So **D** is an odd integer.

MATHS MATE



Teacher Resource



Teacher's Guide to the Use of Maths Mate

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Student Workbook Answers

pages 3 - 72



Student Workbook Short Answers

pages 1 - 8



Problem Solving Hints & Solutions

pages 1 - 20



Test Masters

pages 1 - 32



Test Answers

pages 1 - 32



Record Keeping Sheets

pages 1 - 10



Test 1

Covering worksheets

1.1 - 1.4

Name:

1. [+ Whole Numbers to 10]

	6	1	4	8	2	7	10	3	9	5
+ 10										

2. [- Whole Numbers to 10]

	10	13	12	7	14	9	11	16	5	18
- 3										

3. [× Whole Numbers to 12]

	11	9	6	10	7	3	4	12	5	8
× 4										

4. [÷ Whole Numbers to 12]

	8	4	12	3	9	10	5	11	7	6
÷ 1										

5. [Large Number +,-]
 $7163 - 3092 =$

6. [Large Number ×,+]
 $150000 \div 100 =$

7. [Decimal +,-]
 $26.4 + 35.3 =$

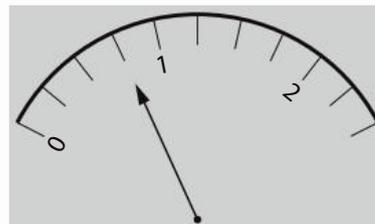
8. [Decimal ×,+]
 $1.28 \times 1000 =$

9. [Fraction +,-]
 $\frac{10}{3} - \frac{2}{3} =$

10. [Fraction ×,+]
 $3 \times \frac{4}{9} =$

11. [Percentages]
 The *Star Princess* crew members represent 32% of the people on board, and the remainder are passengers. What percentage are passengers?

12. [Decimals / Fractions / Percents]
 What decimal number is shown on this meter?



13. [Integers]
 Use < or > to make a true statement.
 -8 -4

14. [Rates / Ratios]
 Simplify the ratio
 $60 : 24$

15. [Indices / Square Roots]
 $8^2 =$

16. [Order of Operations]
 $6 + 27 \div 3 =$

17. [Exploring Numbers]
 What is the value of the underlined digit in the number 7.348?

18. [Multiples / Factors / Primes]
 What is the lowest common multiple (LCM) of 10 and 15?

19. [Number Patterns]
 Complete the pattern:
 2, 3.5, 5, 6.5, ,

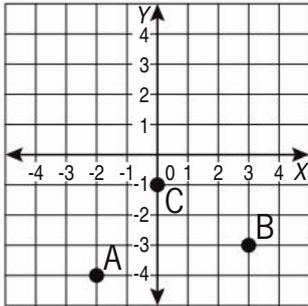
20. [Expressions]
 Simplify
 $vw + vw - vw + vw$

21. [Substitution]
 If $r = 14$, find the value of
 $\frac{r-5}{3}$

22. [Equations]
 $- 18 = 10$

23. [Coordinates]

What are the coordinates of the points A, B and C on this Cartesian plane?



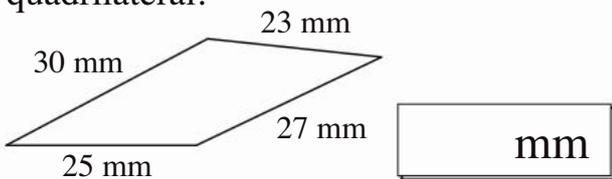
A(,) B(,) C(,)

24. [Units of Measurement / Time]

100 mm = cm

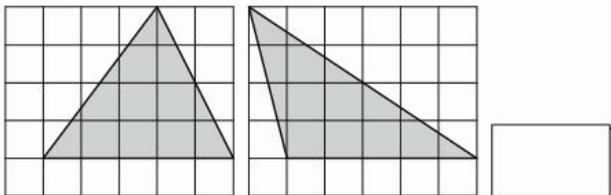
25. [Perimeter]

Calculate the perimeter of the quadrilateral.



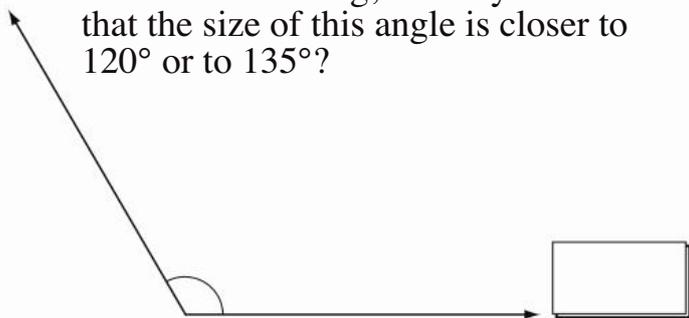
26. [Area / Volume]

Do these triangles have the same area?



27. [Shapes]

Without measuring, would you estimate that the size of this angle is closer to 120° or to 135° ?



28. [Location / Transformation]

Draw the axes of symmetry of these shapes. Circle the shapes that have horizontal symmetry.



29. [Statistics]

What percentage of the total salt content of ocean water is chloride?

COMPARISON:
Ocean water & River water

Chemical Constituent	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Nitrate (NO ₃)	Bromide (Br)
Ocean water	-	-	1.19	3.72	30.53	1.11	0.42	7.67	55.16	-	0.20
River water	14.51	0.74	16.62	4.54	6.98	2.55	31.90	12.41	8.64	1.11	-

% of total salt content

30. [Probability]

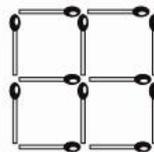
How many different outcomes are possible when choosing a season of the year and rolling a die? [Complete the table.]

Possible outcomes	Die					
	1	2	3	4	5	6
S	S,1	S,2				
A	A,1					
W	W,1					
Sp						



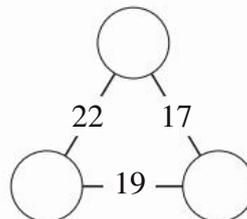
31. [Problem Solving 1]

Which four matches should you remove to leave only one square?



32. [Problem Solving 2]

Enter a number in each circle so that the number on each line equals the sum of the numbers at each end.



33. [Problem Solving 3]

Amy, Bill and Di each work as an artist, a banker or a dentist. Amy and the artist play tennis together. The dentist helped Di plant her garden. Bill is not the dentist and he has not met Amy. What is Di's occupation?



Test 1

Covering worksheets

1.1 - 1.4

Name:

1. [+ Whole Numbers to 10]

	6	8	11	14	7	10	9	12	15	3
+ 1										

2. [- Whole Numbers to 10]

	16	9	5	13	8	11	14	7	10	12
- 2										

3. [× Whole Numbers to 12]

	12	4	8	2	9	5	7	3	10	6
× 3										

4. [÷ Whole Numbers to 12]

	16	32	40	12	20	28	48	36	44	24
÷ 4										

5. [Large Number +,-]
 $4532 - 2371 =$

6. [Large Number ×,+]
 $990\,000 \div 100 =$

7. [Decimal +,-]
 $48.5 + 27.3 =$

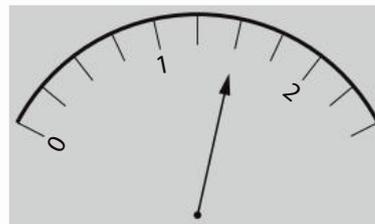
8. [Decimal ×,+]
 $5.63 \times 1000 =$

9. [Fraction +,-]
 $\frac{12}{5} - \frac{3}{5} =$

10. [Fraction ×,+]
 $4 \times \frac{5}{8} =$

11. [Percentages]
 Dark chocolate contains 70% cocoa. What percentage do the other components make?

12. [Decimals / Fractions / Percents]
 What decimal number is shown on this meter?



13. [Integers]
 Use < or > to make a true statement.
 -3 -7

14. [Rates / Ratios]
 Simplify the ratio
 $72 : 48$

15. [Indices / Square Roots]
 $4^2 =$

16. [Order of Operations]
 $48 - 8 \times 3 =$

17. [Exploring Numbers]
 What is the value of the underlined digit in the number 3.085?

18. [Multiples / Factors / Primes]
 What is the lowest common multiple (LCM) of 12 and 18?

19. [Number Patterns]
 Complete the pattern:
 $0, 1.5, 3, 4.5, 6, \underline{\quad}, \underline{\quad}$

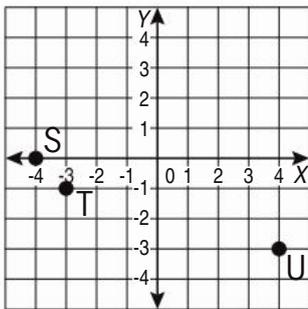
20. [Expressions]
 Simplify
 $yz - yz + yz + yz$

21. [Substitution]
 If $q = 17$, find the value of
 $\frac{q-3}{7}$

22. [Equations]
 $- 11 = 20$

23. [Coordinates]

What are the coordinates of the points S, T and U on this Cartesian plane?



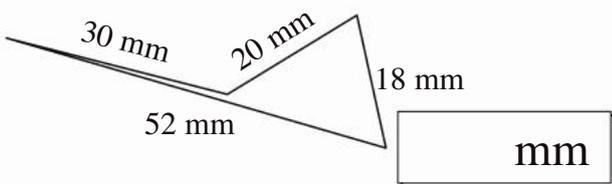
S(,) T(,) U(,)

24. [Units of Measurement / Time]

17 cm = mm

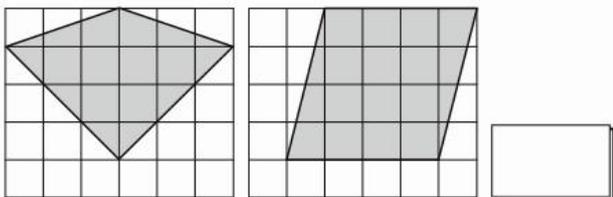
25. [Perimeter]

Calculate the perimeter of the quadrilateral.



26. [Area / Volume]

Do the kite and the parallelogram have the same area?



27. [Shapes]

Without measuring, would you estimate that the size of this angle is closer to 140° or to 155° ?



28. [Location / Transformation]

Draw the axes of symmetry of these shapes. Circle the shapes that have vertical symmetry.



29. [Statistics]

How many earthquakes each year measure 6.2 to 6.9 on the Richter scale?

Earthquake magnitude

Richter Scale	<3.4	3.5 - 4.2	4.3 - 4.8	4.9 - 5.4	5.5 - 6.1	6.2 - 6.9	7.0 - 7.3	7.4 - 7.7	>8
Average number of earthquakes/yr	800 000	30 000	4 800	1 400	500	100	15	4	1 every 5 to 10 yr
Typical effects	Detected only by seismometers	Just about noticeable indoors	Windows rattle	Everyone notices them	Slight damage to buildings	Much damage to buildings	Serious damage	Most buildings collapse	Total damage, ground waves

30. [Probability]

How many different outcomes are possible when spinning a spinner labelled 1, 2, 3, 4 and choosing a state of matter (solid, liquid or gas)?

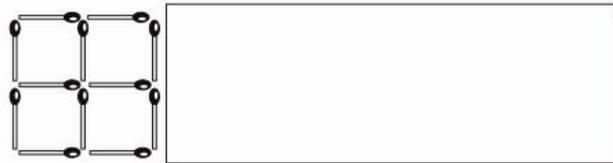
[Complete the table.]

Possible outcomes		Spinner			
		1	2	3	4
state of matter	S	S,1			
	L				
	G				



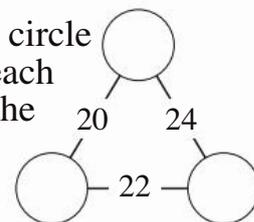
31. [Problem Solving 1]

By moving 3 matches to new positions, change the diagram so that there are 3 squares.



32. [Problem Solving 2]

Enter a number in each circle so that the number on each line equals the sum of the numbers at each end.



33. [Problem Solving 3]

Holly, Annie and Nick went to a costume party as a witch, a queen and a pirate. Each brought a treat to the party. The pirate did not bring cakes. The witch brought fruit. Nick was the queen, and Annie made popcorn. Who dressed as a witch?



Test 2

Covering worksheets

1.5 - 1.8

Name:

1. [+ Whole Numbers to 10]

	17	4	23	8	16	21	25	22	10	19
+ 4										

2. [- Whole Numbers to 10]

	10	5	29	13	21	12	14	27	6	18
- 5										

3. [× Whole Numbers to 12]

	9	3	5	11	7	10	8	12	4	6
× 1										

4. [÷ Whole Numbers to 12]

	96	48	88	56	40	64	24	80	72	32
÷ 8										

5. [Large Number +, -]

$$5655 + 4026 = \boxed{}$$

12. [Decimals / Fractions / Percents]

Simplify $\frac{15}{25}$ $\boxed{}$

17. [Exploring Numbers]

In which number does the digit 3 have greater value? A) 2.73 $\boxed{}$
B) 0.31 $\boxed{}$

6. [Large Number ×, ÷]

$$278 \times 500 = \boxed{}$$

13. [Integers]

The lowest point in Australia is Lake Eyre at -15 m and the highest point is Mt Kosciuszko at 2228 m. What is the height difference?

$$\boxed{} \text{ m}$$

18. [Multiples / Factors / Primes]

List all the factors of 16 in ascending order.

--

7. [Decimal +, -]

$$4.53 - 2.48 = \boxed{}$$

19. [Number Patterns]

Complete the table:

Exercise program

Time (min)	15	30	45	60	75
Energy (cal)	200	400	600		

8. [Decimal ×, ÷]

$$6 \times 2.02 = \boxed{}$$

14. [Rates / Ratios]

The cruising speed of an Airbus A380 is 900 km/h. At this rate how far can it travel in 3 hours?

$$\boxed{} \text{ km}$$

20. [Expressions]

Simplify $7a - 3a + 2a$ $\boxed{}$

9. [Fraction +, -]

$$3\frac{2}{9} - 1\frac{7}{9} = \boxed{}$$

15. [Indices / Square Roots]

$$10^3 = \boxed{}$$

21. [Substitution]

If $h = -5$, find the value of $6h - 4$ $\boxed{}$

10. [Fraction ×, ÷]

$$\frac{1}{2} \text{ of } 250 \text{ g} = \boxed{}$$

16. [Order of Operations]

$$(4 + 6) \div 2 = \boxed{}$$

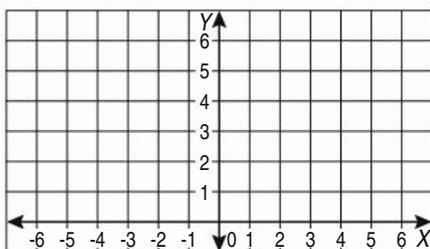
22. [Equations]

$$\boxed{} \times 4 = -32$$

11. [Percentages]

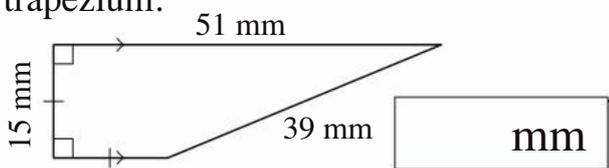
$$60\% \text{ of } \$200 = \$\boxed{}$$

23. [Coordinates]
Draw circles at the following points:
 $(-5,0)$, $(-3,2)$, $(-1,4)$, $(1,6)$

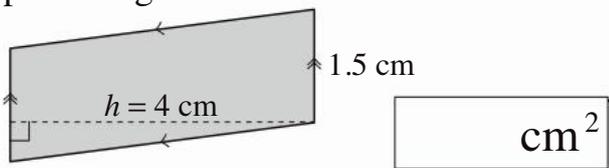


24. [Units of Measurement / Time]
 $1.6 \text{ kg} = \boxed{} \text{ g}$

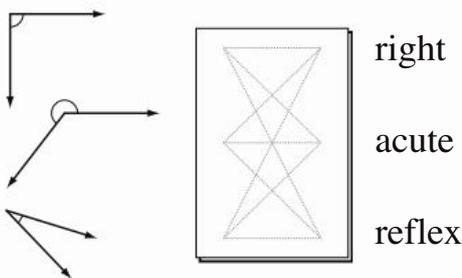
25. [Perimeter]
Calculate the perimeter of the trapezium.



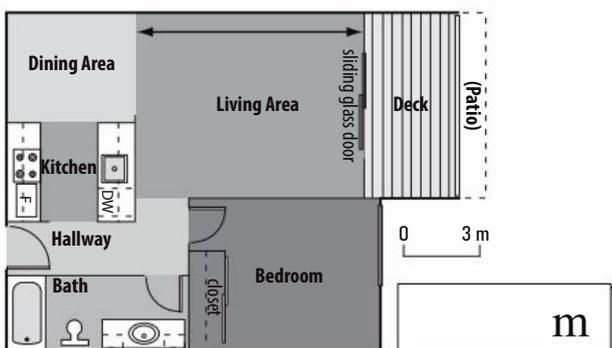
26. [Area / Volume]
Using $A = bh$ find the area of the parallelogram.



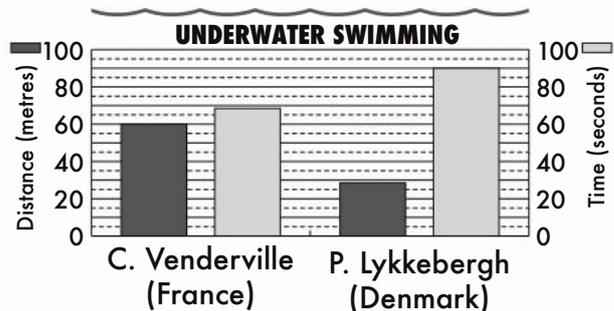
27. [Shapes]
Match each angle to its description:



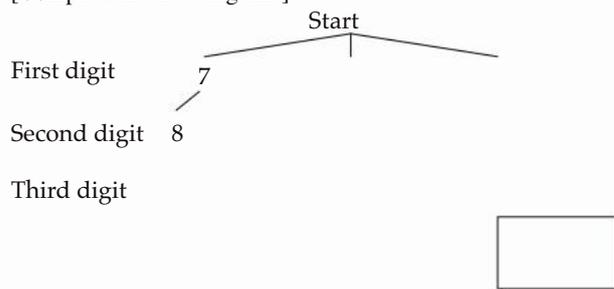
28. [Location / Transformation]
Using the scale, how long is the living area?



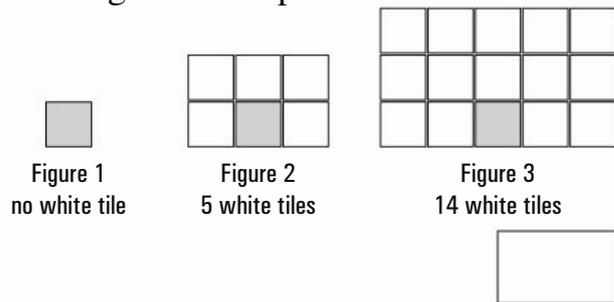
29. [Statistics]
Only during the 1900 Olympics in Paris has underwater swimming ever been considered an Olympic event. The winner was determined by the greatest distance covered. Which country won the event?



30. [Probability]
How many different 3-digit numbers can be made using the digits 7, 8 and 9 if the digits can be used only once?
[Complete the tree diagram.]



31. [Problem Solving 1]
How many white tiles will be in the fifth figure in the pattern?



32. [Problem Solving 2]
Find the value of the product:

$$\frac{15}{13} \times \frac{13}{11} \times \frac{11}{9} \times \frac{9}{7} \times \frac{7}{5} \times \frac{5}{3} = \boxed{}$$

33. [Problem Solving 3]
The sum of the digits of 2015 is 8. How many whole numbers between 100 and 999 have 7 as the sum of their digits?



Test 2

Covering worksheets

1.5 - 1.8

Name:

1. [+ Whole Numbers to 10]

	15	21	9	24	16	23	10	2	27	8
+ 2										

2. [- Whole Numbers to 10]

	25	10	14	9	23	22	6	8	21	17
- 4										

3. [× Whole Numbers to 12]

	9	6	11	5	8	7	4	3	1	10
× 6										

4. [÷ Whole Numbers to 12]

	6	24	18	20	16	22	10	12	8	14
÷ 2										

5. [Large Number +, -]

$$4208 + 2519 = \boxed{}$$

12. [Decimals / Fractions / Percents]

Simplify $\frac{18}{24}$ $\boxed{}$

17. [Exploring Numbers]

In which number does the digit 8 have greater value? A) 0.08 $\boxed{}$
B) 0.908 $\boxed{}$

6. [Large Number ×, ÷]

$$292 \times 400 = \boxed{}$$

13. [Integers]

The lowest point in Argentina is Salinas Chicas at -40 m and the highest is Cerro Aconcagua at 6960 m. What is the height difference?

$\boxed{}$ m

18. [Multiples / Factors / Primes]

List all the factors of 18 in ascending order.

$\boxed{}$

7. [Decimal +, -]

$$9.25 - 3.54 = \boxed{}$$

19. [Number Patterns]

Complete the table:

Hair length (cm)

children	0.5	1	1.5	2	2.5
adults	0.1	0.2	0.3		

8. [Decimal ×, ÷]

$$4 \times 3.08 = \boxed{}$$

14. [Rates / Ratios]

The cruising speed of a Boeing 747 is 910 km/h. At this rate how far can it travel in 4 hours?

$\boxed{}$ km

20. [Expressions]

Simplify $4x - 2x + 3x$ $\boxed{}$

9. [Fraction +, -]

$$4\frac{1}{5} - 2\frac{3}{5} = \boxed{}$$

21. [Substitution]

If $v = -3$, find the value of $7v - 8$ $\boxed{}$

10. [Fraction ×, ÷]

$$\frac{1}{4} \text{ of } 60 \text{ m} = \boxed{}$$

15. [Indices / Square Roots]

$$10^4 = \boxed{}$$

11. [Percentages]

$$40\% \text{ of } \$800 = \$\boxed{}$$

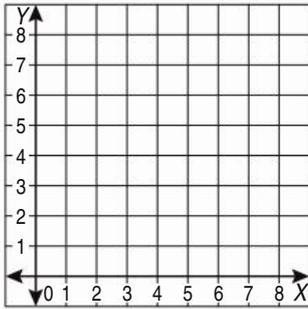
16. [Order of Operations]

$$6 \times (11 + 9) = \boxed{}$$

22. [Equations]

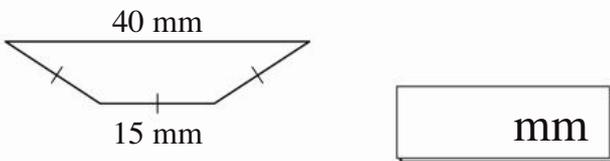
$$3 \times \boxed{} = -18$$

23. [Coordinates]
Draw circles at the following points:
(0,4), (2,3), (4,2), (6,1), (8,0)

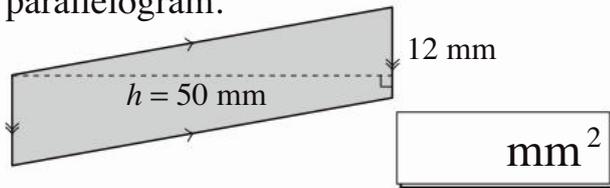


24. [Units of Measurement / Time]
4.3 kg = g

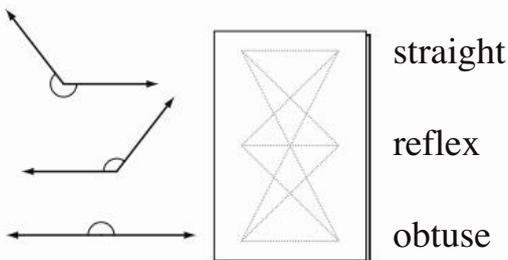
25. [Perimeter]
Calculate the perimeter of the trapezium.



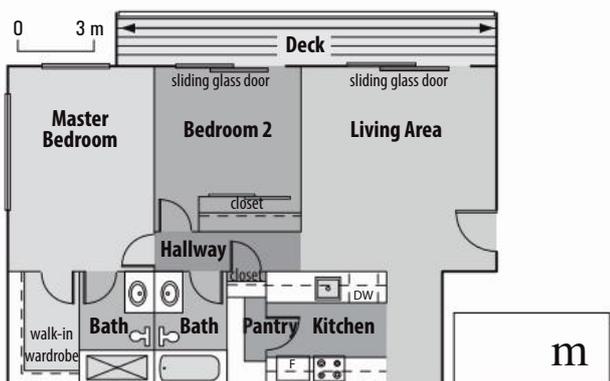
26. [Area / Volume]
Using $A = bh$ find the area of the parallelogram.



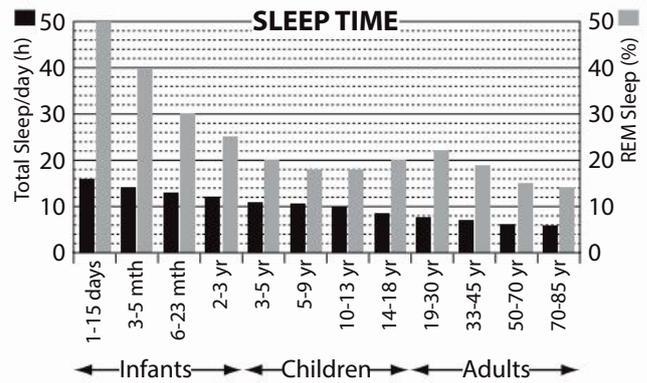
27. [Shapes]
Match each angle to its description:



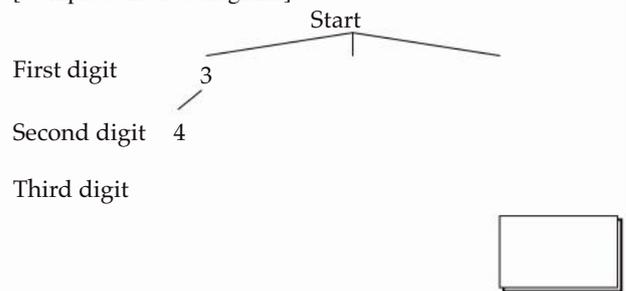
28. [Location / Transformation]
Using the scale, how long is the deck in front of the bedroom and living area?



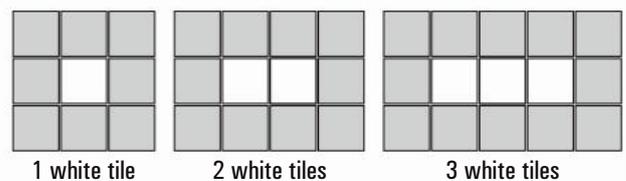
29. [Statistics]
Which age group spends 22% of their 10 hours of sleep each day in REM (rapid eye movement) sleep?



30. [Probability]
How many different 3-digit numbers can be made using the digits 3, 4 and 5 if the digits can be used only once?
[Complete the tree diagram.]



31. [Problem Solving 1]
How many green tiles are needed to go around 10 white tiles, using the pattern shown?



32. [Problem Solving 2]
Find the value of the product:

$$\frac{8}{7} \times \frac{7}{6} \times \frac{6}{5} \times \frac{5}{4} \times \frac{4}{3} \times \frac{3}{2} =$$

33. [Problem Solving 3]
The sum of the digits of 2016 is 9. How many whole numbers between 100 and 999 have 6 as the sum of their digits?



Test 3

Covering worksheets

2.1 - 2.4

Name:

1. [+ Whole Numbers to 10]

	13	12	17	14	1	15	6	9	10	8
+ 3										

2. [- Whole Numbers to 10]

	17	12	20	19	16	15	13	11	18	14
- 10										

3. [× Whole Numbers to 12]

	6	11	8	12	7	3	10	5	9	4
× 5										

4. [÷ Whole Numbers to 12]

	108	54	81	45	99	72	63	36	27	90
÷ 9										

5. [Large Number +,-]

$$6432 - 1509 = \boxed{}$$

6. [Large Number ×,÷]

$$4368 \div 6 = \boxed{}$$

7. [Decimal +,-]

$$5.3 + 16.8 = \boxed{}$$

8. [Decimal ×,÷]

$$618.6 \div 1000 = \boxed{}$$

9. [Fraction +,-]

$$3 - 1\frac{5}{6} = \boxed{}$$

10. [Fraction ×,÷]

$$3 \div \frac{2}{3} = \boxed{}$$

11. [Percentages]

$$25\% \text{ of } 160 = \boxed{}$$

12. [Decimals / Fractions / Percents]

Complete the equivalent fractions:

$$\frac{4}{5} = \frac{12}{\boxed{}} = \frac{\boxed{}}{60}$$

13. [Integers]

Xi bought \$2500 worth of shares. After the first year he gained \$750 but after the second year he lost \$1250. What is the current value of Xi's shares? \$

14. [Rates / Ratios]

The bottle nosed whale can dive at 27000 m per hour. At this rate how far can it dive in a minute? m

15. [Indices / Square Roots]

$$\sqrt{81} = \boxed{}$$

16. [Order of Operations]

$$1 + (12 - 4) \times 3 = \boxed{}$$

17. [Exploring Numbers]

Express in numerals: fifty-three thousand and eleven

18. [Multiples / Factors / Primes]

What is the highest common factor (HCF) of 12 and 30?

19. [Number Patterns]

Complete the pattern: 12.8, 6.4, 3.2, 1.6, ,

20. [Expressions]

Write as an expression: A number that is equal to 20 more than y

21. [Substitution]

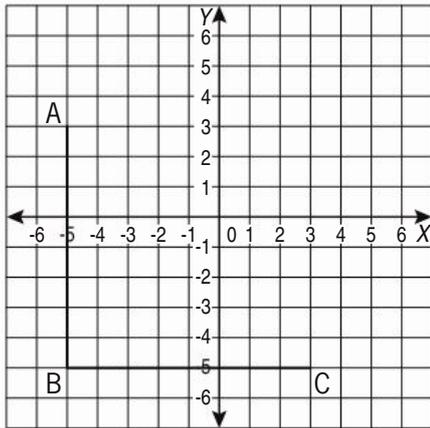
If $a = 44$ and $b = 11$, find the value of $\frac{a}{b}$

22. [Equations]

$$\frac{1}{8} \times \boxed{} = -5$$

23. [Coordinates]

What are the coordinates of point D that will make ABCD a square?

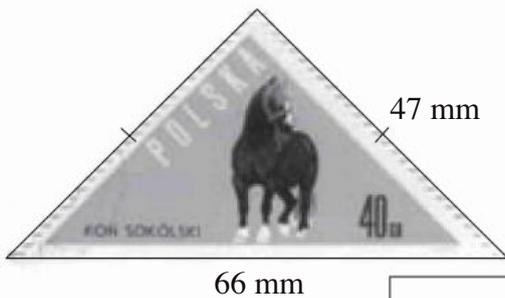


24. [Units of Measurement / Time]

900 m = km

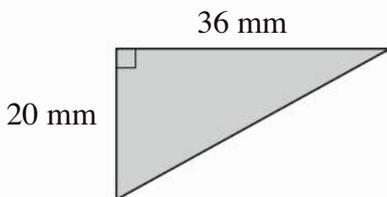
25. [Perimeter]

What is the perimeter of this Polish stamp valued at 40 groszy?


 mm

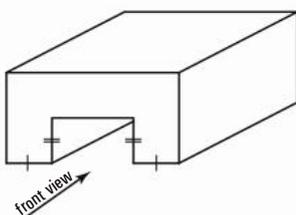
26. [Area / Volume]

Using $A = \frac{1}{2}bh$ find the area of the right-angled triangle.


 mm²

27. [Shapes]

Sketch the front view of this solid.



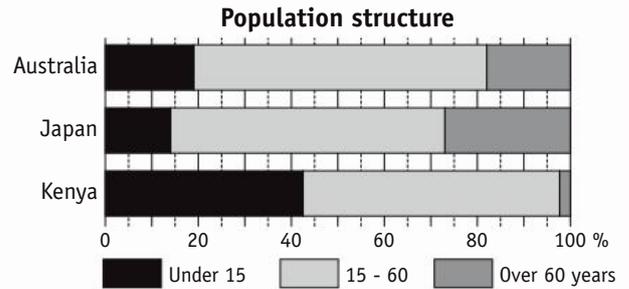
28. [Location / Transformation]

By how many degrees must this shape be rotated to first match the original position?



29. [Statistics]

Which of the countries shown has approximately 27% of their population over the age of 60 years?



30. [Probability]

If a letter tile is chosen at random, find the probability of choosing letter E.

[Give your answer as a fraction.]

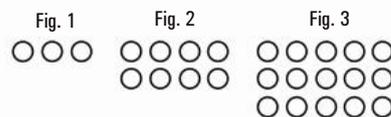


31. [Problem Solving 1]

How many numbers between 1 and 90 are divisible by 4?

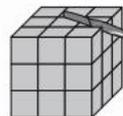
32. [Problem Solving 2]

If this pattern is continued, how many dots will there be in figure 100?



33. [Problem Solving 3]

A solid cube is painted on all 6 faces, and then it is sliced into 27 smaller cubes. How many of these smaller cubes have no paint on them?





Test 3

Covering worksheets

2.1 - 2.4

Name:

1. [+ Whole Numbers to 10]

	10	7	9	13	4	8	2	6	18	11
+ 5										

2. [- Whole Numbers to 10]

	11	14	7	19	12	10	15	8	16	13
- 6										

3. [× Whole Numbers to 12]

	11	7	9	3	12	5	4	10	6	8
× 2										

4. [÷ Whole Numbers to 12]

	12	21	9	30	18	36	24	15	33	27
÷ 3										

5. [Large Number +,-]
 $5743 - 2760 =$

12. [Decimals / Fractions / Percents]
 Complete the equivalent fractions:
 $\frac{3}{4} = \frac{15}{\text{□}} = \frac{\text{□}}{60}$

17. [Exploring Numbers]
 Express in numerals:
 thirty-six thousand and eighteen

6. [Large Number ×,÷]
 $4158 \div 7 =$

13. [Integers]
 Lauren bought \$1500 worth of shares. After the first year she lost \$850 but after the second year she gained \$250. What is the current value of Lauren's shares?
 \$

18. [Multiples / Factors / Primes]
 What is the highest common factor (HCF) of 16 and 36?

7. [Decimal +,-]
 $46.7 + 9.5 =$

19. [Number Patterns]
 Complete the pattern:
 9.6, 4.8, 2.4, 1.2,
,

8. [Decimal ×,÷]
 $275.3 \div 1000 =$

14. [Rates / Ratios]
 The golden eagle can dive at 300 km/h. At this rate how far can it dive in a minute?
 km

20. [Expressions]
 Write as an expression:
 A number that is equal to 9 less than x

9. [Fraction +,-]
 $2 - 1\frac{1}{4} =$

15. [Indices / Square Roots]
 $\sqrt{64} =$

21. [Substitution]
 If $d = 45$ and $e = 5$, find the value of $\frac{d}{e}$

10. [Fraction ×,÷]
 $3 \div \frac{2}{5} =$

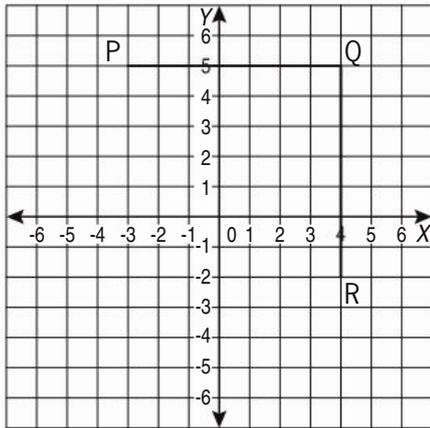
16. [Order of Operations]
 $5 + (11 - 5) \times 3 =$

22. [Equations]
 $\frac{1}{9} \times \text{□} = -4$

11. [Percentages]
 20% of 130 =

23. [Coordinates]

What are the coordinates of point S that will make PQRS a square?

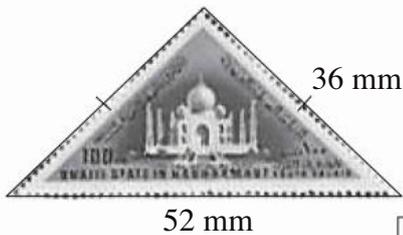


24. [Units of Measurement / Time]

680 cm = m

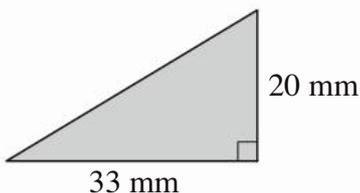
25. [Perimeter]

What is the perimeter of this Indian stamp?


 mm

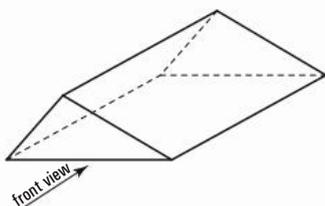
26. [Area / Volume]

Using $A = \frac{1}{2}bh$ find the area of the right-angled triangle.


 mm²

27. [Shapes]

Sketch the front view of this solid.



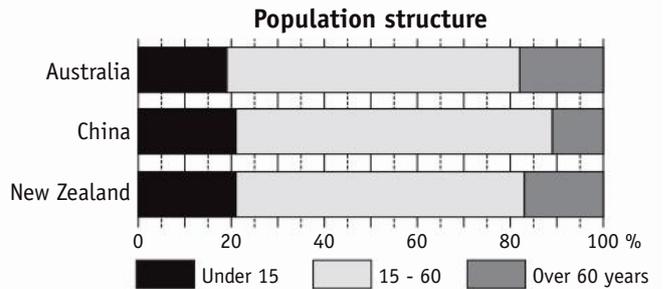
28. [Location / Transformation]

By how many degrees must this shape be rotated to first match the original position?



29. [Statistics]

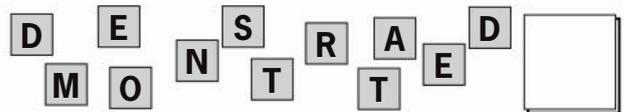
Which of the countries shown has approximately 12% of their population over the age of 60 years?



30. [Probability]

If a letter tile is chosen at random, find the probability of choosing a vowel.

[Give your answer as a fraction in simplest form.]



31. [Problem Solving 1]

How many numbers between 1 and 70 are divisible by 11?

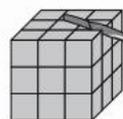
32. [Problem Solving 2]

In the diagram below, thirteen toothpicks have been used to make three terrace houses. Find the number of extra toothpicks required to extend the pattern to nine houses.



33. [Problem Solving 3]

A solid cube is painted on all 6 faces, and then it is sliced into 27 smaller cubes. How many of these smaller cubes are painted on only two faces?





Test 4

Covering worksheets

2.5 - 2.8

Name:

1. [+ Whole Numbers to 10]

	21	4	22	8	17	23	10	9	15	16
+ 7										

2. [- Whole Numbers to 10]

	24	21	16	9	32	10	25	13	48	17
- 9										

3. [× Whole Numbers to 12]

	4	11	3	6	10	8	7	9	12	5
× 11										

4. [÷ Whole Numbers to 12]

	18	30	66	42	48	54	72	36	24	60
÷ 6										

5. [Large Number +, -]

$$5472 + 2683 = \boxed{}$$

6. [Large Number ×, ÷]

$$896 \times 2 = \boxed{}$$

7. [Decimal +, -]

$$46.2 - 8.5 = \boxed{}$$

8. [Decimal ×, ÷]

$$2.2 \times 0.8 = \boxed{}$$

9. [Fraction +, -]

$$\frac{5}{8} + \frac{1}{8} = \boxed{}$$

10. [Fraction ×, ÷]

$$\frac{1}{4} \times \frac{3}{5} = \boxed{}$$

11. [Percentages]

If a \$4000 ring is reduced by 40%, what is the sale price? $\$ \boxed{}$

12. [Decimals / Fractions / Percents]

In Norway, 16% of workers are employed for more than 40 hours per week. Write this percentage as a decimal. $\boxed{}$

13. [Integers]

Nitrogen melts at -210°C . Heat it a further 14°C , and it boils. At what temperature does nitrogen boil? $\boxed{}^{\circ}\text{C}$

14. [Rates / Ratios]

Simplify the ratio
 $21 : 15 : 12$ $\boxed{} : \boxed{} : \boxed{}$

15. [Indices / Square Roots]

$$40^2 = \boxed{}$$

16. [Order of Operations]

$$8 - (21 \div 3 - 6) = \boxed{}$$

17. [Exploring Numbers]

Round 37009 to the nearest thousand. $\boxed{}$

18. [Multiples / Factors / Primes]

List all the prime numbers between 0 and 15. $\boxed{}$

19. [Number Patterns]

Complete the pattern:
 3, 5, 9, 15, 23, $\boxed{}$, $\boxed{}$

20. [Expressions]

Choose the like terms:
 $r, 2rs, rs, 3s$ $\boxed{}$

21. [Substitution]

If $q = 5$ and $r = 4$, find the value of $-2q + 4r$ $\boxed{}$

22. [Equations]

$$30 - 6 \times \boxed{} = 18$$

23. [Coordinates]

Complete the table of values for the linear function $y = 6x$

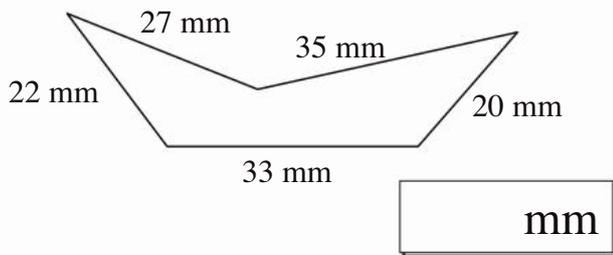
x	$y = 6x$	y
0	$y = 6 \times 0 = 0$	0
1	$y =$	
2		
3		
4		
5		

24. [Units of Measurement / Time]

12 500 mL = L

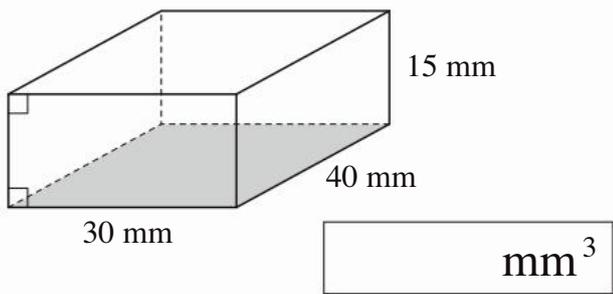
25. [Perimeter]

Calculate the perimeter of the polygon.



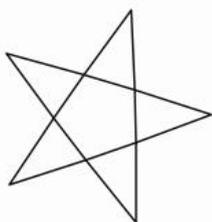
26. [Area / Volume]

Using $V = lwh$ find the volume of the rectangular prism.



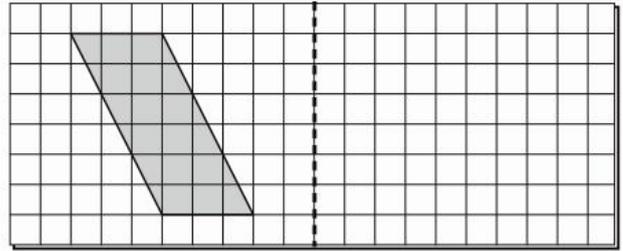
27. [Shapes]

What three-dimensional shape can this net be used to make?



28. [Location / Transformation]

Redraw this parallelogram after reflecting it in the vertical dotted line.



29. [Statistics]

This table shows the average lifespan of various animals. Find the mean (average) of the data.

ANIMAL LIFESPANS - years

gorilla	kangaroo	pig	sheep	lion
6	7	10	12	15

30. [Probability]

A spinner is equally likely to stop on any of the regions numbered 1 to 20. Find the probability of the spinner stopping on a multiple of 4.

[Give your answer as a fraction in simplest form.]

31. [Problem Solving 1]

Two positive numbers have a difference of 5 and a product of 36. Find the two numbers.

32. [Problem Solving 2]

Complete the multiplication table.

\times	2		8
		21	
6		42	
	18		

33. [Problem Solving 3]

The number 54 can be expressed as the sum of two or more consecutive, positive integers in three different ways. One such sequence begins with 12:

$$12 + 13 + 14 + 15 = 54$$

With what number does each of the other two sequences begin?



Test 4

Covering worksheets

2.5 - 2.8

Name:

1. [+ Whole Numbers to 10]

	16	21	12	9	15	17	23	14	10	18
+ 6										

2. [- Whole Numbers to 10]

	17	29	23	10	24	26	18	25	12	21
- 8										

3. [× Whole Numbers to 12]

	10	11	4	5	8	12	7	9	3	6
× 12										

4. [+ Whole Numbers to 12]

	25	50	35	20	55	15	45	60	30	40
÷ 5										

5. [Large Number +,-]
 $4930 + 2785 =$

6. [Large Number ×,+]
 $758 \times 3 =$

7. [Decimal +,-]
 $53.7 - 9.8 =$

8. [Decimal ×,+]
 $1.5 \times 0.7 =$

9. [Fraction +,-]
 $\frac{2}{9} + \frac{1}{9} =$

10. [Fraction ×,+]
 $\frac{3}{8} \times \frac{1}{5} =$

11. [Percentages]
 If a \$30000 car is reduced by 30%, what is the sale price? \$

12. [Decimals / Fractions / Percents]
 In Sweden, 62% of workers are employed for more than 40 hours per week. Write this percentage as a decimal.

13. [Integers]
 Hydrogen melts at -259°C . Warm it a further 6°C , and it boils. At what temperature does hydrogen boil? $^{\circ}\text{C}$

14. [Rates / Ratios]
 Simplify the ratio
 $16 : 24 : 12$:

15. [Indices / Square Roots]
 $90^2 =$

16. [Order of Operations]
 $20 - (23 - 4 \times 2) =$

17. [Exploring Numbers]
 Round 21 610 to the nearest thousand.

18. [Multiples / Factors / Primes]
 List all the prime numbers between 15 and 30.

19. [Number Patterns]
 Complete the pattern:
 2, 5, 10, 17, 26, ,

20. [Expressions]
 Choose the like terms:
 $ef, 4e, 2f, 3ef$

21. [Substitution]
 If $i = 5$ and $j = 4$, find the value of
 $-3i + 6j$

22. [Equations]
 $45 - 7 \times$ $= 10$

23. [Coordinates]

Complete the table of values for the linear function $y = 8x$

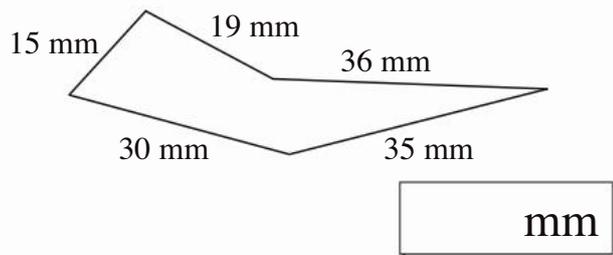
x	$y = 8x$	y
0	$y = 8 \times 0 = 0$	0
1	$y =$	
2		
3		
4		
5		

24. [Units of Measurement / Time]

300 mL = L

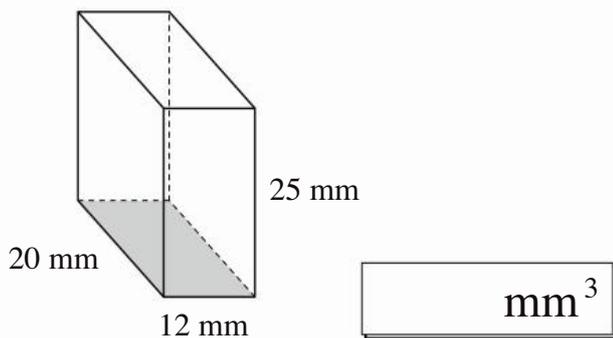
25. [Perimeter]

Calculate the perimeter of the polygon.



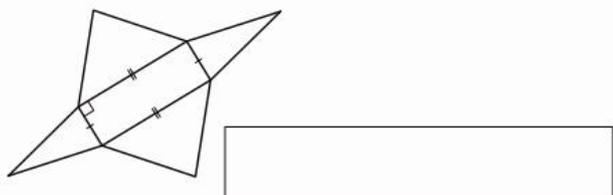
26. [Area / Volume]

Using $V = lwh$ find the volume of the rectangular prism.



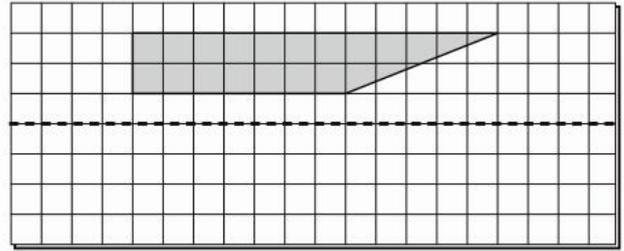
27. [Shapes]

What three-dimensional shape can this net be used to make?



28. [Location / Transformation]

Redraw this trapezium after reflecting it in the horizontal dotted line.



29. [Statistics]

This table shows the average lifespan of some animals. Find the mean (average) of the data.

ANIMAL LIFESPANS - years

wolf	horse	polar bear	elephant	turtle
10	20	20	40	100

30. [Probability]

A set of twenty cards is numbered 1 to 20. If a card is picked at random, what is the probability of choosing a factor of 18? [Give your answer as a fraction in simplest form.]

31. [Problem Solving 1]

Two positive numbers have a difference of 8 and a product of 48. Find the two numbers.

32. [Problem Solving 2]

Complete the multiplication table.

\times	7		6
		36	
8			
	84	108	

33. [Problem Solving 3]

The number 45 can be expressed as the sum of two or more consecutive, positive integers in five different ways. One such sequence begins with 22:

$22 + 23 = 45$

With what number does each of the other four sequences begin?



Test 5

Covering worksheets

3.1 - 3.4

Name:

1. [+ Whole Numbers to 10]

	13	-7	4	8	12	-19	10	5	16	11
+ 8										

2. [- Whole Numbers to 10]

	16	3	18	10	15	22	19	21	17	-14
- 7										

3. [× Whole Numbers to 12]

	8	5	11	2	7	3	10	6	4	9
× 6										

4. [÷ Whole Numbers to 12]

	72	60	132	108	36	84	120	96	48	144
÷ 12										

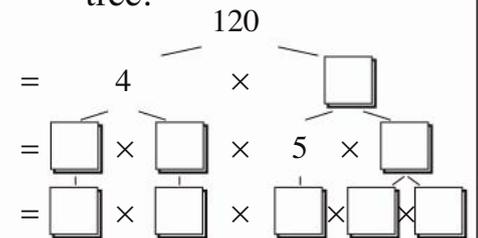
5. [Large Number +,-]
 $39000 - 2745 =$

12. [Decimals / Fractions / Percents]
 Write 0.2 as a fraction in simplest form.

18. [Multiples / Factors / Primes]
 Express 120 as a product of prime numbers by completing the factor tree.

6. [Large Number ×,+]
 $1092 \times 15 =$

13. [Integers]
 $-3 + (-3) =$



7. [Decimal +,-]
 $29.58 + 37.46 =$

14. [Rates / Ratios]
 Complete the equivalent ratios:
 $24 : 15 =$ $: 5$

19. [Number Patterns]
 Complete the pattern:
 23, 23, 22, 20, 17, ,

8. [Decimal ×,+]
 $1.4 \div 0.2 =$

15. [Indices / Square Roots]
 $\sqrt{4900} =$

20. [Expressions]
 The car travels 20 km/h over the speed limit of v km/h. How fast is the car travelling? [Express your answer in terms of v .]

9. [Fraction +,-]
 $2\frac{7}{10} + \frac{9}{10} =$

16. [Order of Operations]
 $3 + (6 - 2)^2 =$

21. [Substitution]
 Use $v = \frac{d}{t}$ to find the speed (v) where $d = 240$ and $t = 3$

10. [Fraction ×,+]
 $\frac{8}{9} \div 4 =$

17. [Exploring Numbers]
 Which fraction has greater value?
 $\frac{3}{5}$ or $\frac{4}{7}$

22. [Equations]
 $1.7 +$ $= 2.4$

11. [Percentages]
 A bracelet costs \$4000. Which is the better deal?
 A) 5% off
 B) \$100 cash back



Test 5

Covering worksheets

3.1 - 3.4

Name:

1. [+ Whole Numbers to 10]

	8	11	-3	7	12	19	5	14	-30	6
+ 9										

2. [- Whole Numbers to 10]

	23	6	4	7	20	9	22	-8	21	15
- 5										

3. [× Whole Numbers to 12]

	7	3	10	8	1	6	9	4	12	5
× 8										

4. [÷ Whole Numbers to 12]

	35	70	49	84	63	28	42	21	77	56
÷ 7										

5. [Large Number +,-]

$$55\,000 - 2426 = \boxed{}$$

6. [Large Number ×,÷]

$$2075 \times 22 = \boxed{}$$

7. [Decimal +,-]

$$33.74 + 29.28 = \boxed{}$$

8. [Decimal ×,÷]

$$1.6 \div 0.4 = \boxed{}$$

9. [Fraction +,-]

$$1\frac{5}{9} + \frac{7}{9} = \boxed{}$$

10. [Fraction ×,÷]

$$\frac{9}{10} \div 3 = \boxed{}$$

11. [Percentages]

A lamp costs \$300. Which is the better deal?

- A) 15% off
 B) \$50 cash back
- $\boxed{}$

12. [Decimals / Fractions / Percents]

Write 0.05 as a fraction in simplest form. $\boxed{}$

13. [Integers]

$$-4 + (-3) = \boxed{}$$

14. [Rates / Ratios]

Complete the equivalent ratios:
 $42 : 60 = 10 : \boxed{}$

15. [Indices / Square Roots]

$$\sqrt{6400} = \boxed{}$$

16. [Order of Operations]

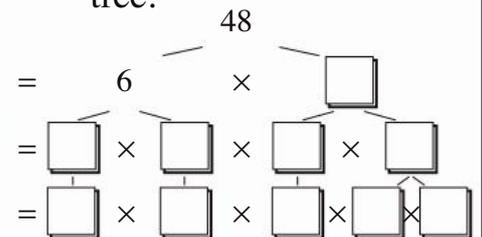
$$5 + (8 - 5)^2 = \boxed{}$$

17. [Exploring Numbers]

Which fraction has greater value?
 $\frac{4}{5}$ or $\frac{5}{6}$ $\boxed{}$

18. [Multiples / Factors / Primes]

Express 48 as a product of prime numbers by completing the factor tree.



19. [Number Patterns]

Complete the pattern:
 57, 56, 54, 51, 47, $\boxed{}$, $\boxed{}$

20. [Expressions]

Julie is x years old. How old will she be in 10 years time? [Express your answer in terms of x .] $\boxed{}$

21. [Substitution]

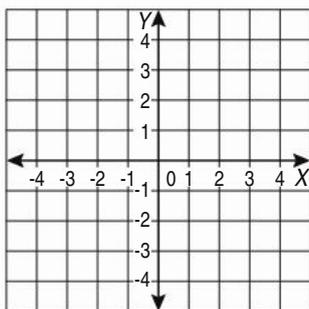
Use $t = \frac{d}{v}$ to find the time (t) where $d = 120$ and $v = 60$ $\boxed{}$

22. [Equations]

$$\boxed{} + 1.8 = 2.4$$

23. [Coordinates]

Draw a line through all the points where the x -coordinate is 4 more than the y -coordinate (line of equation $y = x - 4$).

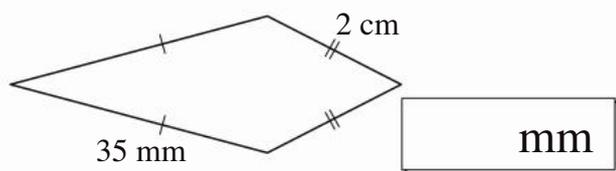


24. [Units of Measurement / Time]

3 h 15 min = min

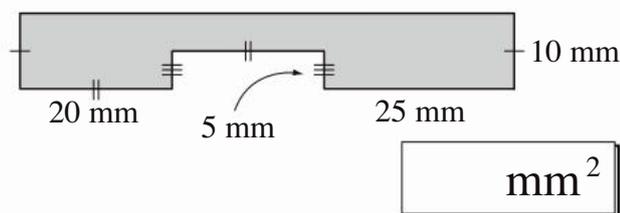
25. [Perimeter]

Calculate the perimeter of the kite in millimetres.



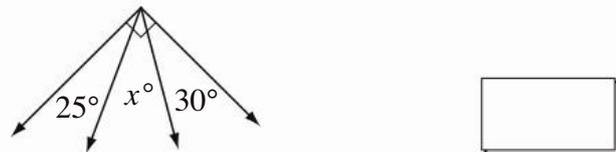
26. [Area / Volume]

Find the area of the polygon.



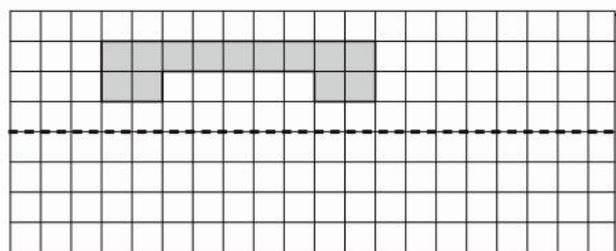
27. [Shapes]

Find the value of x° .



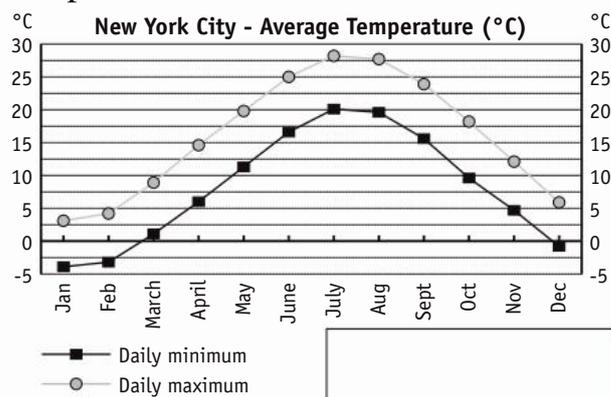
28. [Location / Transformation]

Redraw this shape after reflecting it in the horizontal dotted line and then translating it 3 units to the right.



29. [Statistics]

In which month are the highest daily maximum and minimum average temperatures recorded?



30. [Probability]

Which event is most unlikely to happen?

- A) drawing a black card from a deck of 52 playing cards
- B) turning 'tails' on a tossed coin
- C) selecting a multiple of 5 from numbers 10 to 19

31. [Problem Solving 1]

The base 4 number 312_4 is equivalent to:

$$3 \times 4^2 + 1 \times 4^1 + 2 \times 4^0$$

$$= 48 + 4 + 2$$

$$= 54 \text{ in base 10 } [5 \times 10^1 + 4 \times 10^0]$$

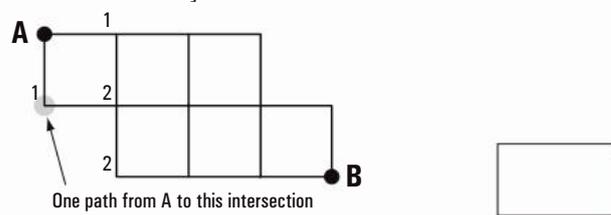
What is 132_4 equal to in base 10?

32. [Problem Solving 2]

Two cannons are fired together at 8:00 am. One cannon then fires again every 120 minutes while the other cannon continues to fire every 75 minutes. At what time will the two cannons both fire at the same time again?

33. [Problem Solving 3]

You are to go from A to B, always moving right or down along the lines. On how many different paths can you go? [The number of paths from A to various intersections has been included.]





Test 6

Covering worksheets

3.5 - 3.8

Name:

1. [+ Whole Numbers to 10]

	5	8	13	20	-14	19	12	26	-1	17
+ 5										

2. [- Whole Numbers to 10]

	14	17	1	-8	12	29	15	10	-13	16
- 4										

3. [× Whole Numbers to 12]

	8	12	5	9	4	11	7	3	6	10
× 7										

4. [÷ Whole Numbers to 12]

	77	44	132	110	55	99	33	66	121	88
÷ 11										

5. [Large Number +,-]

$$76\,606 + 4726 = \boxed{}$$

6. [Large Number ×,÷]

$$52\,800 \div 11 = \boxed{}$$

7. [Decimal +,-]

$$86.31 - 8.07 = \boxed{}$$

8. [Decimal ×,÷]

$$0.24 \div 0.8 = \boxed{}$$

9. [Fraction +,-]

$$\frac{2}{3} + \frac{4}{15} = \boxed{}$$

10. [Fraction ×,÷]

$$\frac{7}{8} \times \frac{2}{5} = \boxed{}$$

11. [Percentages]

$$250\% \text{ of } 60 = \boxed{}$$

12. [Decimals / Fractions / Percents]

In 2017, an estimated 22% of Australians had a convict ancestor. Write this percentage as a fraction in simplest form. $\boxed{}$

13. [Integers]

$$-7 - (-7) = \boxed{}$$

14. [Rates / Ratios]

Which is the best buy?
 A) a 200 g energy drink can at \$4.00
 B) a 750 g energy drink can at \$12.00 $\boxed{}$

15. [Indices / Square Roots]

$$2^4 = \boxed{}$$

16. [Order of Operations]

$$8 \div 2^2 + 22 - 7 = \boxed{}$$

17. [Exploring Numbers]

Round 0.9408 to three decimal places. $\boxed{}$

18. [Multiples / Factors / Primes]

Express 21 as a product of its prime factors.

$$21 = \boxed{}$$

19. [Number Patterns]

Complete the pattern:

20, 14, 8, 2, -4, $\boxed{}$, $\boxed{}$

20. [Expressions]

Simplify $e + e - e + f$

$$\boxed{}$$

21. [Substitution]

If $e = 3$, find the value of $2e^2 - e$ $\boxed{}$

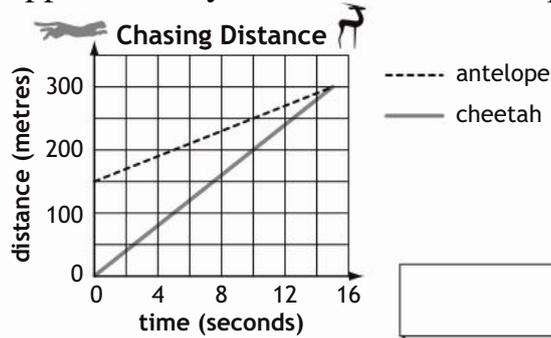
22. [Equations]

Solve for x : $12 - x = 4$

$$x = \boxed{}$$

23. [Coordinates]

A cheetah is chasing an antelope. After how many seconds is the cheetah approximately 50 metres behind its prey?

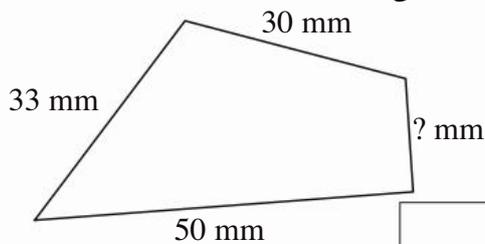


24. [Units of Measurement / Time]

In a full grown rye plant, the combined length of the roots may reach 613 km. Express this in metres.

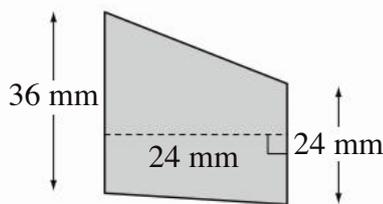
25. [Perimeter]

The perimeter of this quadrilateral is 128 mm. Find the missing side length.



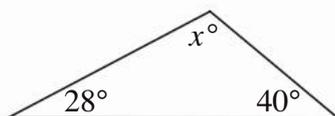
26. [Area / Volume]

Using $A = \frac{1}{2}(a + b)h$ find the area of the trapezium.



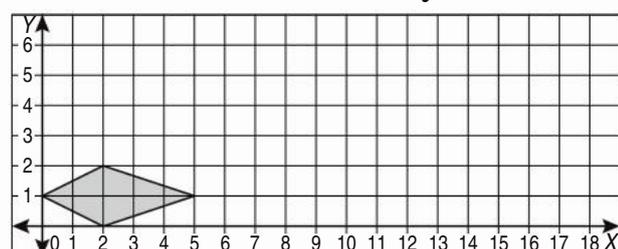
27. [Shapes]

Find the value of x° .



28. [Location / Transformation]

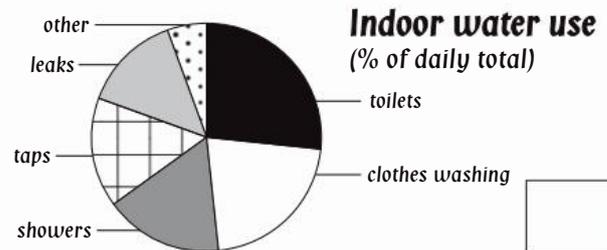
Redraw the kite after multiplying the coordinates of its vertices by 3.



29. [Statistics]

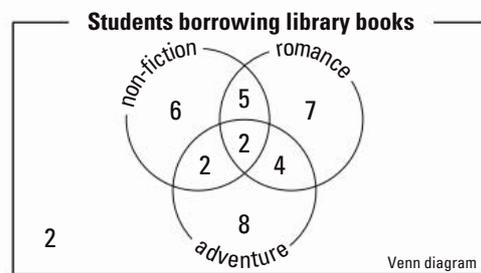
Approximately what percentage of indoor water usage is accounted for by toilets?

- A) 5%
- B) 15%
- C) 25%
- D) 50%



30. [Probability]

What is the probability that a student chosen at random borrowed an adventure book? [Give your answer as a fraction in simplest form.]



31. [Problem Solving 1]

What is the smallest positive integer, greater than 1, which when divided by 5 or 6 leaves a remainder of 1?

32. [Problem Solving 2]

A fence, 3 sections long, requires 4 posts and 6 rails, as shown. How many posts and rails are required to build a fence 20 sections long?



posts = rails =

33. [Problem Solving 3]

A 3rd grade maths test included this rather tough challenge. Can you solve it?

If $1 * 4 = 5$
 $2 * 2 = 6$
 $3 * 5 = 2$
 and $3 * 6 = 1$ find the value of $4 * 4 = ?$



Test 6

Covering worksheets

3.5 - 3.8

Name:

1. [+ Whole Numbers to 10]

	10	14	9	12	-15	18	-1	7	13	6
+ 7										

2. [- Whole Numbers to 10]

	13	22	10	-1	17	8	16	24	9	5
- 9										

3. [× Whole Numbers to 12]

	1	6	3	10	4	8	5	7	12	9
× 11										

4. [÷ Whole Numbers to 12]

	80	32	96	48	40	24	88	72	56	64
÷ 8										

5. [Large Number +, -]

$$24930 + 7578 =$$

6. [Large Number ×, ÷]

$$58800 \div 12 =$$

7. [Decimal +, -]

$$35.42 - 9.04 =$$

8. [Decimal ×, ÷]

$$0.27 \div 0.3 =$$

9. [Fraction +, -]

$$\frac{5}{18} + \frac{1}{3} =$$

10. [Fraction ×, ÷]

$$\frac{3}{8} \times \frac{4}{5} =$$

11. [Percentages]

$$110\% \text{ of } 50 =$$

12. [Decimals / Fractions / Percents]

In Iceland 66% of university degrees are earned by women. Write this percentage as a fraction in simplest form.

13. [Integers]

$$-8 - (-5) =$$

14. [Rates / Ratios]

Which is the best buy?

- A) a 400 g jar of honey at \$9.60
- B) a 150 g jar of honey at \$3.30

15. [Indices / Square Roots]

$$5^3 =$$

16. [Order of Operations]

$$4 \times 5 - 2 \times 3^2 =$$

17. [Exploring Numbers]

Round 5.0644 to three decimal places.

18. [Multiples / Factors / Primes]

Express 33 as a product of its prime factors.

$$33 =$$

19. [Number Patterns]

Complete the pattern:

$$25, 18, 11, 4, -3, \quad \boxed{\quad}, \quad \boxed{\quad}$$

20. [Expressions]

Simplify $g + g + g - h$

21. [Substitution]

If $m = 2$, find the value of $3m^2 - m$

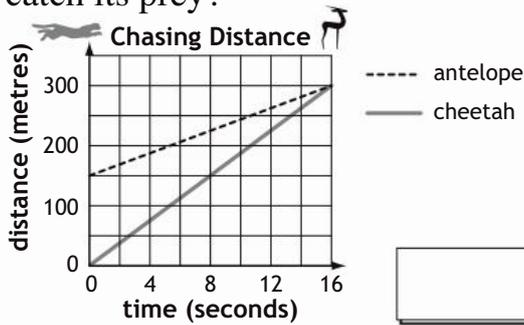
22. [Equations]

Solve for x : $20 - x = 18$

$$x =$$

23. [Coordinates]

A cheetah is chasing an antelope. After how many seconds does the cheetah catch its prey?

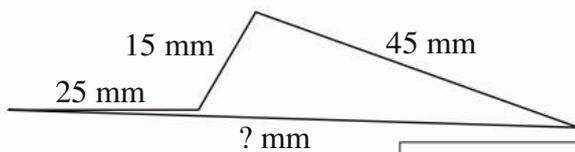


24. [Units of Measurement / Time]

Measuring from base to peak, Mauna Kea (Hawaii) is the tallest mountain on earth. It rises 10 200 m from the depths of the ocean. Express this in kilometres.

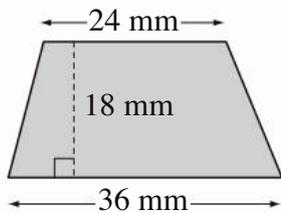
25. [Perimeter]

The perimeter of this quadrilateral is 160 mm. Find the missing side length.



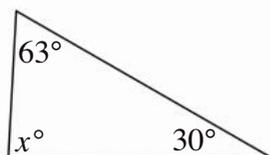
26. [Area / Volume]

Using $A = \frac{1}{2}(a + b)h$ find the area of the trapezium.



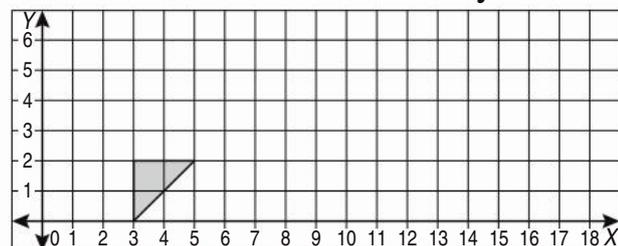
27. [Shapes]

Find the value of x° .



28. [Location / Transformation]

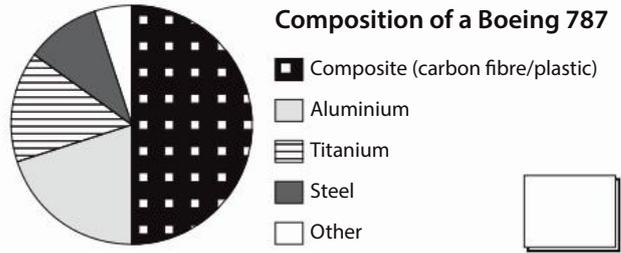
Redraw the triangle after multiplying the coordinates of its vertices by 3.



29. [Statistics]

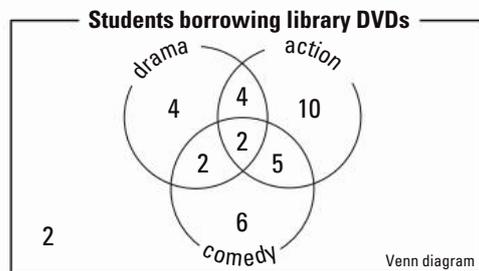
Approximately what percentage of a Boeing 787 is made of aluminium?

- A) 15% B) 20%
 C) 30% D) 40%



30. [Probability]

What is the probability that a student chosen at random borrows an action DVD? [Give your answer as a fraction in simplest form.]



31. [Problem Solving 1]

What is the smallest positive integer, other than 2, which when divided by 4 or 9 leaves a remainder of 2?

32. [Problem Solving 2]

A fence, 3 sections long, requires 4 posts and 6 rails, as shown. How many posts and rails are required to build a fence 17 sections long?



posts = rails =

33. [Problem Solving 3]

A 3rd grade maths test included this rather tough challenge. Can you solve it?

If $2 * 6 = 4$
 $4 * 1 = 7$
 $3 * 4 = 5$
 and $8 * 3 = 1$ find the value of
 $5 * 2 = ?$



Test 7

Covering worksheets

4.1 - 4.4

Name:

1. [+ Whole Numbers to 10]

	11	3	15	10	-26	7	19	-8	22	24
+ 4										

2. [- Whole Numbers to 10]

	27	4	10	22	-16	9	28	31	23	-15
- 8										

3. [× Whole Numbers to 12]

	11	4	7	10	12	9	-5	8	3	-6
× 9										

4. [+ Whole Numbers to 12]

	20	24	32	-12	40	36	48	28	16	44
÷ 4										

5. [Large Number +, -]

$$5914 + 3387 + 236 =$$

6. [Large Number ×, ÷]

$$637 \times 140 =$$

7. [Decimal +, -]

$$2.58 + 0.7 + 62.4 =$$

8. [Decimal ×, ÷]

$$0.4 \times 0.06 =$$

9. [Fraction +, -]

$$\frac{5}{8} - \frac{1}{3} =$$

10. [Fraction ×, ÷]

$$\frac{2}{3} \div \frac{5}{9} =$$

11. [Percentages]

At the 2016 Rio Olympics, 2 of the 10 medals won by South Africa were gold. What percentage is this?

12. [Decimals / Fractions / Percents]

Complete the table:

Decimal	Fraction	Percent
	$\frac{23}{50}$	

13. [Integers]

$$8 \times (-4) =$$

14. [Rates / Ratios]

Stainless steel is 90% iron and 10% chrome. Find the ratio of iron to chrome.

15. [Indices / Square Roots]

Between which two consecutive whole numbers does $\sqrt{30}$ lie?

16. [Order of Operations]

$$-4 - 10 + 2^3 \times 3 =$$

17. [Exploring Numbers]

Choose the integers from this list:

$\frac{8}{2}$, $\frac{5}{15}$, -16, 0, -2.4

18. [Multiples / Factors / Primes]

Express 54 as a product of its prime factors using index notation.

$$54 =$$

19. [Number Patterns]

Find the 15th term in the pattern:

2, 4, 6, 8, 10, ...

20. [Expressions]

Simplify $2d - d + 3e + e$

21. [Substitution]

If $n = 4$, find the value of $3(n - 1)$

22. [Equations]

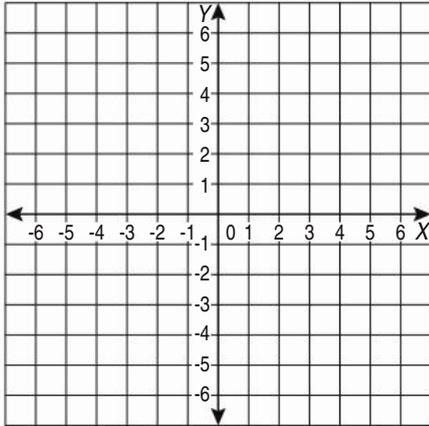
Solve for w : $4w = -12$

$$w =$$

23. [Coordinates]

Using the table of values, plot the points on the Cartesian plane.

x	-6	-4	-2	0	2	4
y	4	3	2	1	0	-1



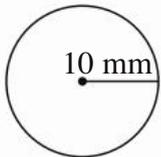
24. [Units of Measurement / Time]

The school concert starts at 4:15 pm and ends at 7:00 pm. How long is the concert in hours and minutes?

h	min
---	-----

25. [Perimeter]

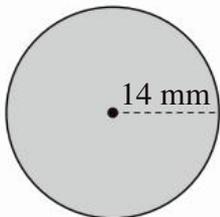
Using $C = 2\pi r$ where $\pi \approx 3.14$, calculate the circumference of the circle.



mm

26. [Area / Volume]

Using $A = \pi r^2$ and $\pi \approx \frac{22}{7}$, find the area of the circle.



mm ²

27. [Shapes]

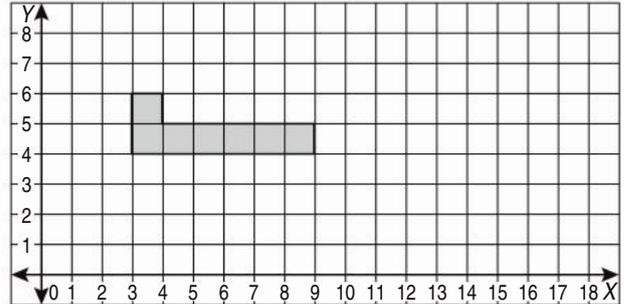
Find the value of x° .



--

28. [Location / Transformation]

Redraw this shape after rotating it 180° about the point of coordinates (9,4).



29. [Statistics]

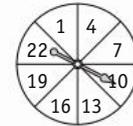
Find the median and range of the average monthly maximum temperatures for Sydney.

Stem	Leaf	
1	7 8 8	Key 2 8 = 28°C
2	0 1 2 3 3 5 5 6 6	

median =	range =
----------	---------

30. [Probability]

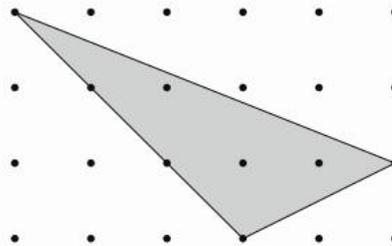
When the spinner is spun once, what is the probability of spinning a number that is not a multiple of 4? [Give your answer as a fraction in simplest form.]



--

31. [Problem Solving 1]

What is the area of the triangle in square centimetres?



Area = 1 cm ²

cm ²

32. [Problem Solving 2]

In how many ways can 15 one-dollar coins be shared between Felix, Anna and Jodie, if each of them receives at least 4 coins?

--

33. [Problem Solving 3]

Each letter stands for a different digit. If WAIT = 8472, what number does STOP represent?

G O
+ S L O W

S T O P

--



Test 7

Covering worksheets

4.1 - 4.4

Name:

1. [+ Whole Numbers to 10]

	15	-14	7	22	6	19	-13	11	20	8
+ 6										

2. [- Whole Numbers to 10]

	25	-14	30	7	32	1	18	29	23	16
- 7										

3. [× Whole Numbers to 12]

	11	8	-4	10	3	12	7	-6	5	9
× 12										

4. [÷ Whole Numbers to 12]

	27	81	63	108	45	36	90	54	99	-72
÷ 9										

5. [Large Number +, -]

$$4873 + 3207 + 845 =$$

6. [Large Number ×, ÷]

$$524 \times 230 =$$

7. [Decimal +, -]

$$0.42 + 83.19 + 2.4 =$$

8. [Decimal ×, ÷]

$$0.5 \times 0.07 =$$

9. [Fraction +, -]

$$\frac{1}{3} - \frac{1}{10} =$$

10. [Fraction ×, ÷]

$$\frac{7}{8} \div \frac{3}{4} =$$

11. [Percentages]

At the 2016 Rio Olympics, 2 of the 8 medals won by Serbia were bronze. What percentage is this?

12. [Decimals / Fractions / Percents]

Complete the table:

Decimal	Fraction	Percent
	$\frac{31}{50}$	

13. [Integers]

$$3 \times (-7) =$$

14. [Rates / Ratios]

A male horse has 40 teeth and a female horse has 36 teeth. Find the ratio of the number of teeth in male to female horses.

15. [Indices / Square Roots]

Between which two consecutive whole numbers does $\sqrt{40}$ lie?

 and

16. [Order of Operations]

$$3 + 14 \div 7 - 2^3 =$$

17. [Exploring Numbers]

Choose the integers from this list:

$$-\frac{2}{3}, \frac{9}{3}, 0.04, -48, 2009$$

18. [Multiples / Factors / Primes]

Express 36 as a product of its prime factors using index notation.

$$36 =$$

19. [Number Patterns]

Find the 20th term in the pattern:

$$1, 3, 5, 7, 9, \dots$$

20. [Expressions]

$$\text{Simplify } 3z - a + z + 2a$$

21. [Substitution]

If $u = 3$, find the value of $6(u + 7)$

22. [Equations]

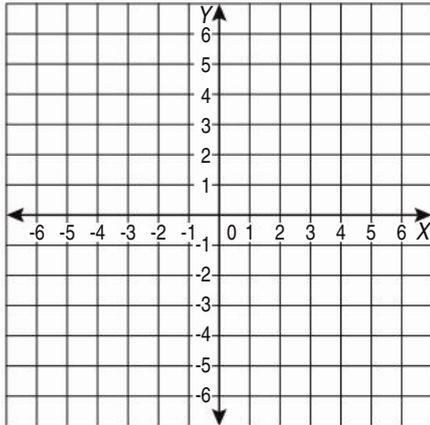
$$\text{Solve for } z: 4z = -20$$

$$z =$$

23. [Coordinates]

Using the table of values, plot the points on the Cartesian plane.

x	-6	-4	-2	0	2	4
y	-6	-5	-4	-3	-2	-1



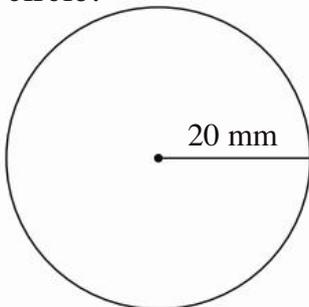
24. [Units of Measurement / Time]

Mum started cooking at 8:40 am and finished at 10:05 am. How long did she cook in hours and minutes?

h	min
---	-----

25. [Perimeter]

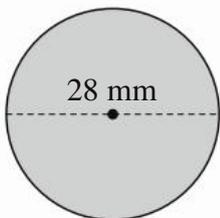
Using $C = 2\pi r$ where $\pi \approx 3.14$, calculate the circumference of the circle.



mm

26. [Area / Volume]

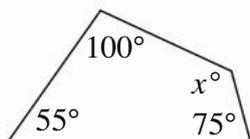
Using $A = \pi r^2$ and $\pi \approx \frac{22}{7}$, find the area of the circle.



mm ²

27. [Shapes]

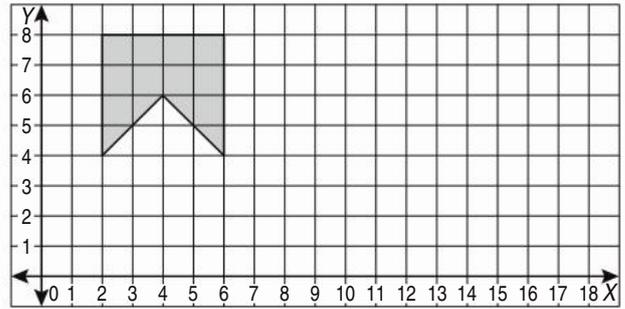
Find the value of x° .



--

28. [Location / Transformation]

Redraw this shape after rotating it 180° about the point of coordinates (6,4).



29. [Statistics]

Find the median and range of the average monthly maximum temperatures for Melbourne.

Stem	Leaf
1	3 4 4 6 7 9
2	0 1 3 4 5 5

Key
2|8 = 28°C

median =	range =
----------	---------

30. [Probability]

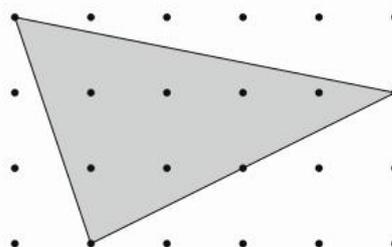
When the spinner is spun once, what is the probability of stopping on a section that is not red (R)? [Give your answer as a fraction.]



--

31. [Problem Solving 1]

What is the area of the triangle in square centimetres?



Area = 1 cm ²

cm ²

32. [Problem Solving 2]

In how many ways can 14 one-dollar coins be shared between Vince, Stella and Alvis, if each of them receives at least 4 coins?

--

33. [Problem Solving 3]

Each letter stands for a different digit from 1 to 9. If TWO = 428, what number does RIGHT represent?

W R O N G
+ W R O N G

R I G H T

--



Test 8

Covering worksheets

4.5 - 4.8

Name:

1. [+ Whole Numbers to 10]

	-3	-16	8	22	19	1	14	15	7	-10
+ 9										

2. [- Whole Numbers to 10]

	3	24	17	-10	25	12	-26	9	-18	21
- 5										

3. [× Whole Numbers to 12]

	-9	4	8	11	3	6	5	-12	7	10
× 8										

4. [+ Whole Numbers to 12]

	60	-54	24	-36	48	72	42	30	66	18
÷ 6										

5. [Large Number +,-]
 $264 + 9578 - 666 =$

12. [Decimals / Fractions / Percents]
 Which is greater?
 $\frac{3}{5}$ or 64%

18. [Multiples / Factors / Primes]
 What is the smallest positive integer that has exactly six factors?

6. [Large Number ×,+]
 $3130 \div 4 =$

13. [Integers]
 $-27 \div 9 =$

19. [Number Patterns]
 If the general rule of a pattern is $6n + 3$ find the 11th term ($n = 11$).

7. [Decimal +,-]
 $7 - 1.92 =$

14. [Rates / Ratios]
 The average heart beat rate for persons 1 to 3 years old is 130 beats per minute at rest. At this rate how many times is the heart beating in one hour?

20. [Expressions]
 Simplify
 $3v + 4w - 2w + 2v$

8. [Decimal ×,+]
 $8 \div 0.5 =$

15. [Indices / Square Roots]
 $(-11)^2 =$

9. [Fraction +,-]
 $4\frac{1}{8} - 1\frac{7}{8} =$

16. [Order of Operations]
 $10 - 2^3 \div \sqrt{4} =$

21. [Substitution]
 If $h = 8$ and $i = 4$, find the value of $3h - i^2$

10. [Fraction ×,+]
 $\frac{5}{8} \times \frac{2}{5} =$

17. [Exploring Numbers]
 Which is **not** a rational number?
 A) 0 B) $-\frac{3}{7}$
 C) π D) 8.24

22. [Equations]
 Solve for y:
 $4y - 3 = -23$ $y =$

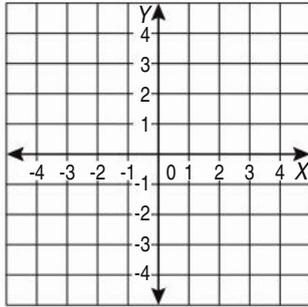
11. [Percentages]
 Carla purchased a lounge suite for \$2400. If she later sold it for \$1800, find the loss as a percentage of the cost price.

23. [Coordinates]

Graph the line of equation $y = x + 4$ by first completing this table of values.

[Label the line with the equation.]

x	-4	-3	-2	-1	0
y	0				
(x,y)	(-4,0)	(,)	(,)	(,)	(,)

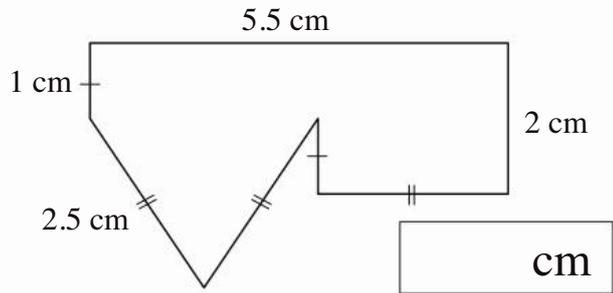


24. [Units of Measurement / Time]

It is 4:30 pm in Perth. If Perth time is 2 hours behind Melbourne time, what time is it in Melbourne?

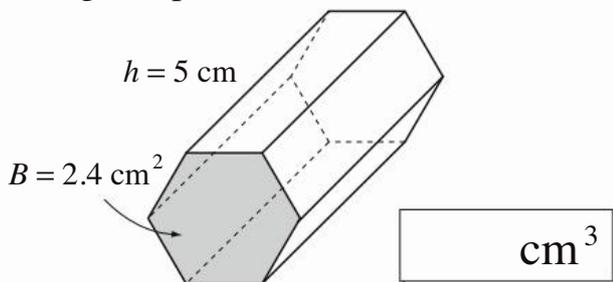
25. [Perimeter]

Calculate the perimeter of the polygon.



26. [Area / Volume]

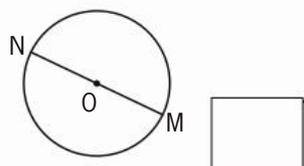
Using $V = Bh$ find the volume of the hexagonal prism.



27. [Shapes]

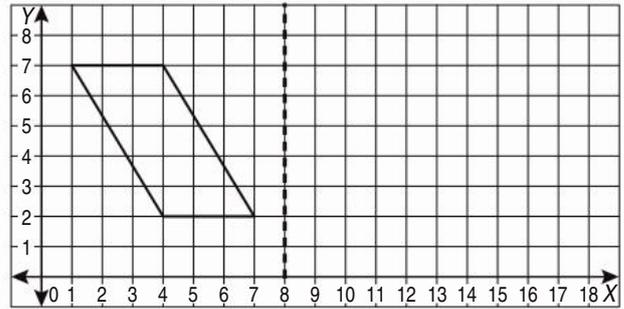
What is \overline{OM} in this diagram?

- A) radius
- B) circumference
- C) diameter
- D) tangent



28. [Location / Transformation]

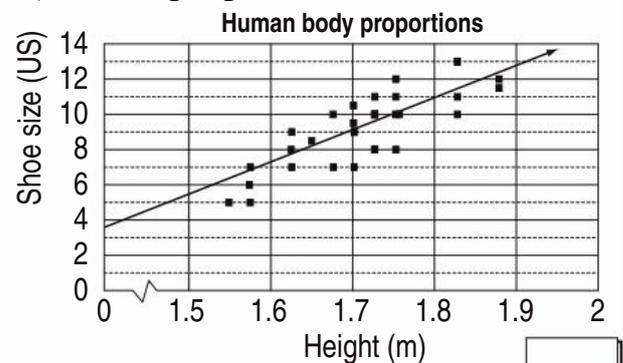
Redraw this parallelogram after reflecting it in the line of equation $x = 8$



29. [Statistics]

Which describes the relationship?

- A) Taller people have bigger feet
- B) Shorter people have bigger feet
- C) Taller people have smaller shoes



30. [Probability]

How many possible outfits can be created with 6 different shirts, 4 different skirts and 2 different pairs of shoes?

31. [Problem Solving 1]

The fraction of boys in our school band has risen from $\frac{2}{5}$ to $\frac{1}{2}$ with the arrival of the Harper twin boys. How many band members are there now?

32. [Problem Solving 2]

Four consecutive whole numbers are added. If the smallest number is $n + 3$, what is the sum of the four numbers?

33. [Problem Solving 3]

If n is an integer, which of the following must be an even integer?

- A) n^3
- B) $2n - 1$
- C) $2n^2 + 2$
- D) $n + 10$



Test 8

Covering worksheets

4.5 - 4.8

Name:

1. [+ Whole Numbers to 10]

	4	17	23	9	11	-15	12	8	10	-16
+ 8										

2. [- Whole Numbers to 10]

	13	-7	14	12	-15	10	6	11	19	18
- 6										

3. [× Whole Numbers to 12]

	12	6	-11	5	8	7	3	9	-4	10
× 5										

4. [÷ Whole Numbers to 12]

	120	60	72	132	96	-36	-84	144	108	48
÷ 12										

5. [Large Number +, -]

$$382 + 8752 - 555 =$$

6. [Large Number ×, ÷]

$$3064 \div 5 =$$

7. [Decimal +, -]

$$9 - 6.74 =$$

8. [Decimal ×, ÷]

$$3 \div 0.2 =$$

9. [Fraction +, -]

$$3\frac{3}{10} - 1\frac{9}{10} =$$

10. [Fraction ×, ÷]

$$\frac{5}{9} \times \frac{9}{10} =$$

11. [Percentages]

A shop buys shirts in bulk for \$25 each and then sells them for \$45 each. Calculate the profit on each shirt as a percentage of the cost price.

12. [Decimals / Fractions / Percents]

Which is greater?

$$\frac{2}{5} \text{ or } 42\%$$

13. [Integers]

$$-20 \div 5 =$$

14. [Rates / Ratios]

The average resting heart beat for people over 16 years of age is 70 beats per minute. At this rate how many times is the heart beating in one and a half hours?

15. [Indices / Square Roots]

$$(-9)^2 =$$

16. [Order of Operations]

$$12 - 3^3 \div \sqrt{9} =$$

17. [Exploring Numbers]

Which is **not** a rational number?

A) -0.5 B) $-\sqrt{8}$

C) 69 D) 1

18. [Multiples / Factors / Primes]

What is the smallest positive integer that has exactly five factors?

19. [Number Patterns]

If the general rule of a pattern is $3n + 5$ find the 12th term ($n = 12$).

20. [Expressions]

Simplify $5d + 2c + d - c$

21. [Substitution]

If $m = 9$ and $n = 5$, find the value of $4m - n^2$

22. [Equations]

Solve for g :

$$2g - 6 = -18$$

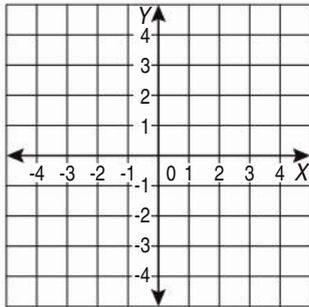
$g =$

23. [Coordinates]

Graph the line of equation $y = x - 3$ by first completing this table of values.

[Label the line with the equation.]

x	-1	0	1	2	3
y	-4				
(x,y)	(-1,-4)	(,)	(,)	(,)	(,)

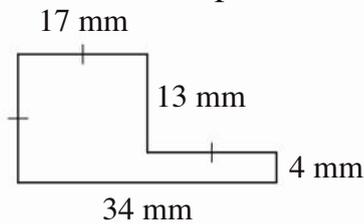


24. [Units of Measurement / Time]

It is 12:00 pm in Brisbane. If Auckland time is 3 hours ahead of Brisbane time, what time is it in Auckland?

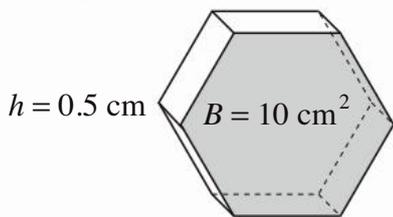
25. [Perimeter]

Calculate the perimeter of the polygon.



26. [Area / Volume]

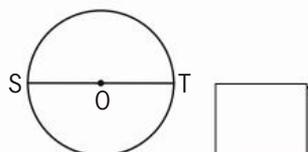
Using $V = Bh$ find the volume of the hexagonal prism.



27. [Shapes]

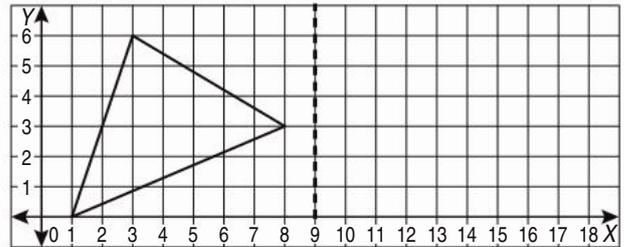
What is \overline{ST} in this diagram?

- A) radius
- B) circumference
- C) diameter
- D) tangent



28. [Location / Transformation]

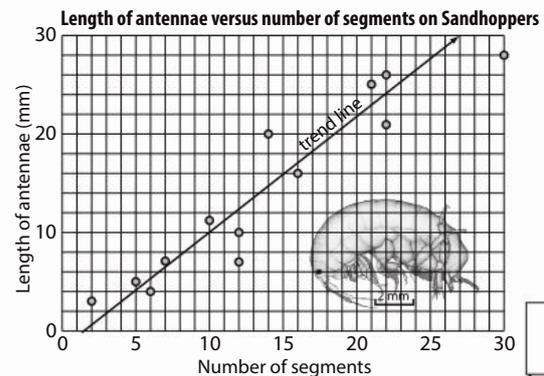
Redraw this triangle after reflecting it in the line of equation $x = 9$



29. [Statistics]

Which best describes the relationship?

- A) More segments, shorter antennae
- B) Less segments, longer antennae
- C) More segments, longer antennae



30. [Probability]

Chu has 5 rock, 4 hip hop and 6 rap songs on his CD. How many combinations are possible if Chu randomly selects 1 from each song style?

31. [Problem Solving 1]

The school board would like to raise the fraction of fathers on the board from $\frac{1}{3}$ to $\frac{1}{2}$. This could be done by replacing just two mothers with fathers. How many parents are on the school board?

32. [Problem Solving 2]

Four consecutive whole numbers are added. If the smallest number is $n + 1$, what is the sum of the four numbers?

33. [Problem Solving 3]

If n is an integer, which of the following must be an odd integer?

- A) $3n + 3$
- B) $2n - 3$
- C) $n^2 + 1$
- D) $n + 5$

MATHS MATE



Teacher Resource



Teacher's Guide to the Use of Maths Mate

pages i - viii



Student Workbook Answers

pages 3 - 72



Student Workbook Short Answers

pages 1 - 8



Problem Solving Hints & Solutions

pages 1 - 20



Test Masters

pages 1 - 32



Test Answers

pages 1 - 32



Record Keeping Sheets

pages 1 - 10

MATHS MATE



Test 1

Covering worksheets

1.1 - 1.4

Name:

1. [+ Whole Numbers to 10]

	6	1	4	8	2	7	10	3	9	5
+ 10	16	11	14	18	12	17	20	13	19	15

2. [- Whole Numbers to 10]

	10	13	12	7	14	9	11	16	5	18
- 3	7	10	9	4	11	6	8	13	2	15

3. [× Whole Numbers to 12]

	11	9	6	10	7	3	4	12	5	8
× 4	44	36	24	40	28	12	16	48	20	32

4. [÷ Whole Numbers to 12]

	8	4	12	3	9	10	5	11	7	6
÷ 1	8	4	12	3	9	10	5	11	7	6

5. [Large Number +, -]

$$7163 - 3092 = \boxed{4071}$$

6. [Large Number ×, ÷]

$$150000 \div 100 = \boxed{1500}$$

7. [Decimal +, -]

$$26.4 + 35.3 = \boxed{61.7}$$

8. [Decimal ×, ÷]

$$1.28 \times 1000 = \boxed{1280}$$

9. [Fraction +, -]

$$\frac{10}{3} - \frac{2}{3} = \boxed{2\frac{2}{3}}$$

10. [Fraction ×, ÷]

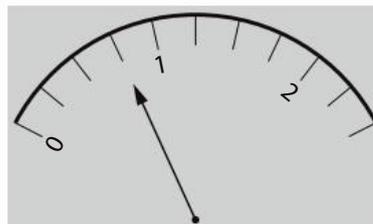
$$3 \times \frac{4}{9} = \boxed{1\frac{1}{3}}$$

11. [Percentages]

The *Star Princess* crew members represent 32% of the people on board, and the remainder are passengers. What percentage are passengers? $\boxed{68\%}$

12. [Decimals / Fractions / Percents]

What decimal number is shown on this meter?



$\boxed{0.75}$

13. [Integers]

Use < or > to make a true statement.

$$-8 \quad \boxed{<} \quad -4$$

14. [Rates / Ratios]

Simplify the ratio

$$60 : 24 = \boxed{5 : 2}$$

15. [Indices / Square Roots]

$$8^2 = \boxed{64}$$

16. [Order of Operations]

$$6 + 27 \div 3 = \boxed{15}$$

17. [Exploring Numbers]

What is the value of the underlined digit in the number 7.348?

$$\text{or } \frac{4}{100} \quad \boxed{0.04}$$

18. [Multiples / Factors / Primes]

What is the lowest common multiple (LCM) of 10 and 15? $\boxed{30}$

19. [Number Patterns]

Complete the pattern:

$$2, 3.5, 5, 6.5, \quad \boxed{8}, \quad \boxed{9.5}$$

20. [Expressions]

Simplify

$$vw + vw - vw + vw$$

$$\boxed{2vw}$$

21. [Substitution]

If $r = 14$, find the value of

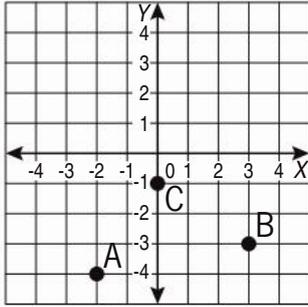
$$\frac{r-5}{3} \quad \boxed{3}$$

22. [Equations]

$$\boxed{28} - 18 = 10$$

23. [Coordinates]

What are the coordinates of the points A, B and C on this Cartesian plane?



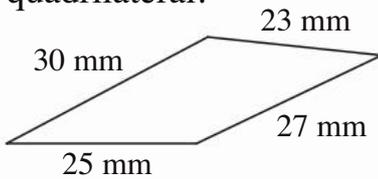
A(-2,-4) B(3,-3) C(0,-1)

24. [Units of Measurement / Time]

100 mm = **10** cm

25. [Perimeter]

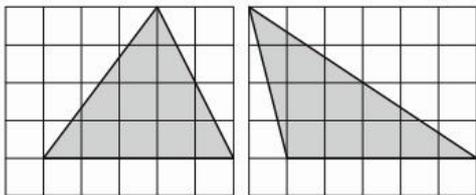
Calculate the perimeter of the quadrilateral.



105 mm

26. [Area / Volume]

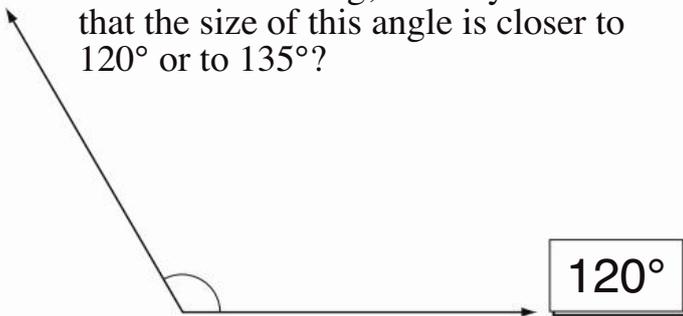
Do these triangles have the same area?



yes

27. [Shapes]

Without measuring, would you estimate that the size of this angle is closer to 120° or to 135° ?



120°

28. [Location / Transformation]

Draw the axes of symmetry of these shapes. Circle the shapes that have horizontal symmetry.



29. [Statistics]

What percentage of the total salt content of ocean water is chloride?

COMPARISON:
Ocean water
&
River water

Chemical Constituent	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Nitrate (NO ₃)	Bromide (Br)
Ocean water	-	-	1.19	3.72	30.53	1.11	0.42	7.67	55.16	-	0.20
River water	14.51	0.74	16.62	4.54	6.98	2.55	31.90	12.41	8.64	1.11	-

% of total salt content

55.16%

30. [Probability]

How many different outcomes are possible when choosing a season of the year and rolling a die? [Complete the table.]

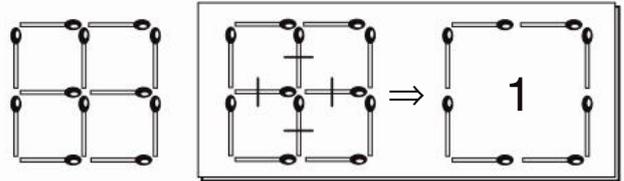
Possible outcomes	Die					
	1	2	3	4	5	6
S	S,1	S,2	S,3	S,4	S,5	S,6
A	A,1	A,2	A,3	A,4	A,5	A,6
W	W,1	W,2	W,3	W,4	W,5	W,6
Sp	Sp,1	Sp,2	Sp,3	Sp,4	Sp,5	Sp,6



24

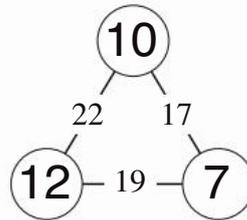
31. [Problem Solving 1]

Which four matches should you remove to leave only one square?



32. [Problem Solving 2]

Enter a number in each circle so that the number on each line equals the sum of the numbers at each end.



33. [Problem Solving 3]

Amy, Bill and Di each work as an artist, a banker or a dentist. Amy and the artist play tennis together. The dentist helped Di plant her garden. Bill is not the dentist and he has not met Amy. What is Di's occupation?

artist



Test 1

Covering worksheets

1.1 - 1.4

Name:

1. [+ Whole Numbers to 10]

	6	8	11	14	7	10	9	12	15	3
+ 1	7	9	12	15	8	11	10	13	16	4

2. [- Whole Numbers to 10]

	16	9	5	13	8	11	14	7	10	12
- 2	14	7	3	11	6	9	12	5	8	10

3. [× Whole Numbers to 12]

	12	4	8	2	9	5	7	3	10	6
× 3	36	12	24	6	27	15	21	9	30	18

4. [÷ Whole Numbers to 12]

	16	32	40	12	20	28	48	36	44	24
÷ 4	4	8	10	3	5	7	12	9	11	6

5. [Large Number +,-]

$$4532 - 2371 = \boxed{2161}$$

6. [Large Number ×,÷]

$$990000 \div 100 = \boxed{9900}$$

7. [Decimal +,-]

$$48.5 + 27.3 = \boxed{75.8}$$

8. [Decimal ×,÷]

$$5.63 \times 1000 = \boxed{5630}$$

9. [Fraction +,-]

$$\frac{12}{5} - \frac{3}{5} = \boxed{1\frac{4}{5}}$$

10. [Fraction ×,÷]

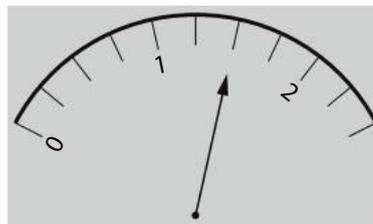
$$4 \times \frac{5}{8} = \boxed{2\frac{1}{2}}$$

11. [Percentages]

Dark chocolate contains 70% cocoa. What percentage do the other components make? $\boxed{30\%}$

12. [Decimals / Fractions / Percents]

What decimal number is shown on this meter?



$\boxed{1.5}$

13. [Integers]

Use < or > to make a true statement.

$$-3 \quad \boxed{>} \quad -7$$

14. [Rates / Ratios]

Simplify the ratio

$$72 : 48 \quad \boxed{3:2}$$

15. [Indices / Square Roots]

$$4^2 = \boxed{16}$$

16. [Order of Operations]

$$48 - 8 \times 3 = \boxed{24}$$

17. [Exploring Numbers]

What is the value of the underlined digit in the number 3.085?

$$\text{or } \frac{8}{100} \quad \boxed{0.08}$$

18. [Multiples / Factors / Primes]

What is the lowest common multiple (LCM) of 12 and 18? $\boxed{36}$

19. [Number Patterns]

Complete the pattern:

$$0, 1.5, 3, 4.5, 6, \boxed{7.5}, \boxed{9}$$

20. [Expressions]

Simplify $yz - yz + yz + yz$ $\boxed{2yz}$

21. [Substitution]

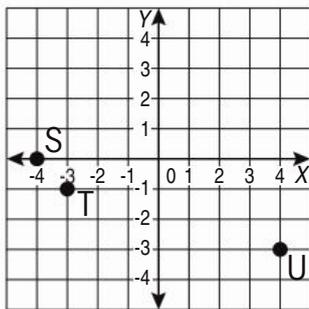
If $q = 17$, find the value of $\frac{q-3}{7}$ $\boxed{2}$

22. [Equations]

$$\boxed{31} - 11 = 20$$

23. [Coordinates]

What are the coordinates of the points S, T and U on this Cartesian plane?



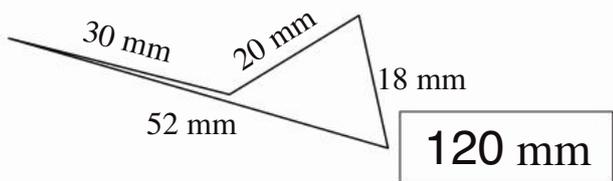
S(-4, 0) T(-3, -1) U(4, -3)

24. [Units of Measurement / Time]

17 cm = 170 mm

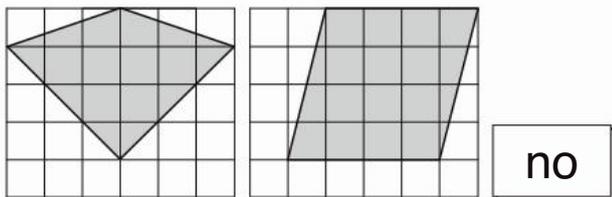
25. [Perimeter]

Calculate the perimeter of the quadrilateral.



26. [Area / Volume]

Do the kite and the parallelogram have the same area?



27. [Shapes]

Without measuring, would you estimate that the size of this angle is closer to 140° or to 155° ?



28. [Location / Transformation]

Draw the axes of symmetry of these shapes. Circle the shapes that have vertical symmetry.



29. [Statistics]

How many earthquakes each year measure 6.2 to 6.9 on the Richter scale?

Earthquake magnitude

Richter Scale	<3.4	3.5 - 4.2	4.3 - 4.8	4.9 - 5.4	5.5 - 6.1	6.2 - 6.9	7.0 - 7.3	7.4 - 7.7	>8
Average number of earthquakes/yr	800 000	30 000	4 800	1 400	500	100	15	4	1 every 5 to 10 yr
Typical effects	Detected only by seismometers	Just about noticeable indoors	Windows rattle	Everyone notices them	Slight damage to buildings	Much damage to buildings	Serious damage	Most buildings collapse	Total damage, ground waves

100

30. [Probability]

How many different outcomes are possible when spinning a spinner labelled 1, 2, 3, 4 and choosing a state of matter (solid, liquid or gas)?

[Complete the table.]

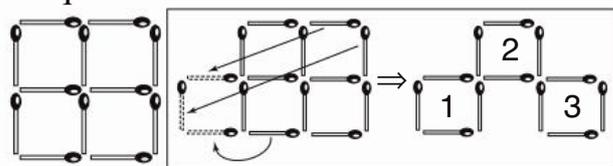
Possible outcomes		Spinner			
		1	2	3	4
state of matter	S	S,1	S,2	S,3	S,4
	L	L,1	L,2	L,3	L,4
	G	G,1	G,2	G,3	G,4



12

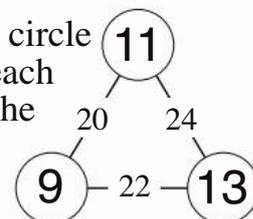
31. [Problem Solving 1]

By moving 3 matches to new positions, change the diagram so that there are 3 squares.



32. [Problem Solving 2]

Enter a number in each circle so that the number on each line equals the sum of the numbers at each end.



33. [Problem Solving 3]

Holly, Annie and Nick went to a costume party as a witch, a queen and a pirate. Each brought a treat to the party. The pirate did not bring cakes. The witch brought fruit. Nick was the queen, and Annie made popcorn. Who dressed as a witch?

Holly

MATHS MATE



Test 2

Covering worksheets

1.5 - 1.8

Name:

1. [+ Whole Numbers to 10]

	17	4	23	8	16	21	25	22	10	19
+ 4	21	8	27	12	20	25	29	26	14	23

2. [- Whole Numbers to 10]

	10	5	29	13	21	12	14	27	6	18
- 5	5	0	24	8	16	7	9	22	1	13

3. [× Whole Numbers to 12]

	9	3	5	11	7	10	8	12	4	6
× 1	9	3	5	11	7	10	8	12	4	6

4. [÷ Whole Numbers to 12]

	96	48	88	56	40	64	24	80	72	32
÷ 8	12	6	11	7	5	8	3	10	9	4

5. [Large Number +, -]

$$5655 + 4026 = \boxed{9681}$$

12. [Decimals / Fractions / Percents]

$$\text{Simplify } \frac{15}{25} \quad \boxed{\frac{3}{5}}$$

17. [Exploring Numbers]

In which number does the digit 3 have greater value? A) 2.73 B) 0.31 B

6. [Large Number ×, ÷]

$$278 \times 500 = \boxed{139\,000}$$

13. [Integers]

The lowest point in Australia is Lake Eyre at -15 m and the highest point is Mt Kosciuszko at 2228 m. What is the height difference?

$$\boxed{2243 \text{ m}}$$

18. [Multiples / Factors / Primes]

List all the factors of 16 in ascending order.

$$\boxed{1, 2, 4, 8, 16}$$

7. [Decimal +, -]

$$4.53 - 2.48 = \boxed{2.05}$$

19. [Number Patterns]

Complete the table:

Exercise program

Time (min)	15	30	45	60	75
Energy (cal)	200	400	600	800	1000

8. [Decimal ×, ÷]

$$6 \times 2.02 = \boxed{12.12}$$

14. [Rates / Ratios]

The cruising speed of an Airbus A380 is 900 km/h. At this rate how far can it travel in 3 hours?

$$\boxed{2700 \text{ km}}$$

20. [Expressions]

$$\text{Simplify } 7a - 3a + 2a \quad \boxed{6a}$$

9. [Fraction +, -]

$$3\frac{2}{9} - 1\frac{7}{9} = \boxed{1\frac{4}{9}}$$

10. [Fraction ×, ÷]

$$\frac{1}{2} \text{ of } 250 \text{ g} = \boxed{125 \text{ g}}$$

15. [Indices / Square Roots]

$$10^3 = \boxed{1000}$$

21. [Substitution]

$$\text{If } h = -5, \text{ find the value of } 6h - 4 \quad \boxed{-34}$$

11. [Percentages]

$$60\% \text{ of } \$200 = \boxed{\$120}$$

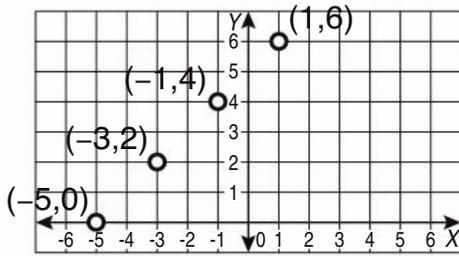
16. [Order of Operations]

$$(4 + 6) \div 2 = \boxed{5}$$

22. [Equations]

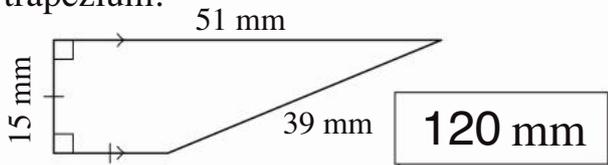
$$\boxed{-8} \times 4 = -32$$

23. [Coordinates]
Draw circles at the following points:
 $(-5,0)$, $(-3,2)$, $(-1,4)$, $(1,6)$

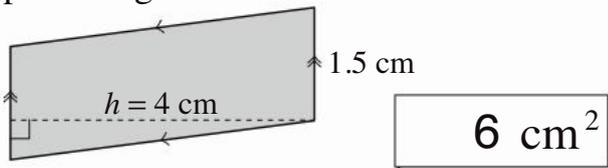


24. [Units of Measurement / Time]
 $1.6 \text{ kg} = \boxed{1600} \text{ g}$

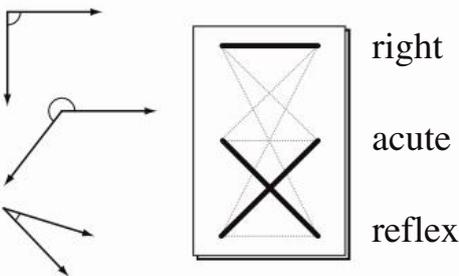
25. [Perimeter]
Calculate the perimeter of the trapezium.



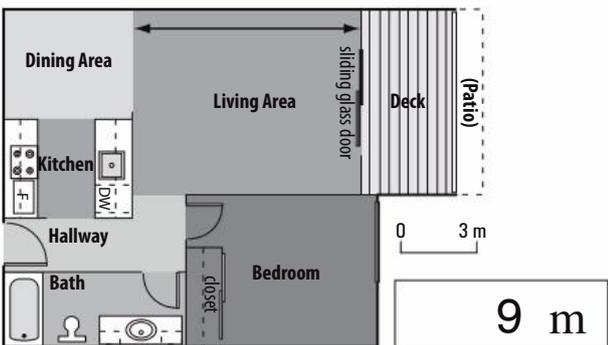
26. [Area / Volume]
Using $A = bh$ find the area of the parallelogram.



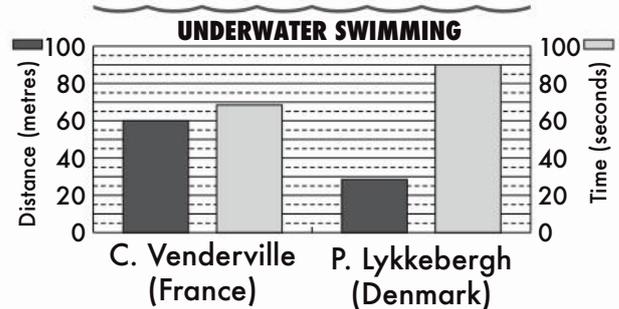
27. [Shapes]
Match each angle to its description:



28. [Location / Transformation]
Using the scale, how long is the living area?

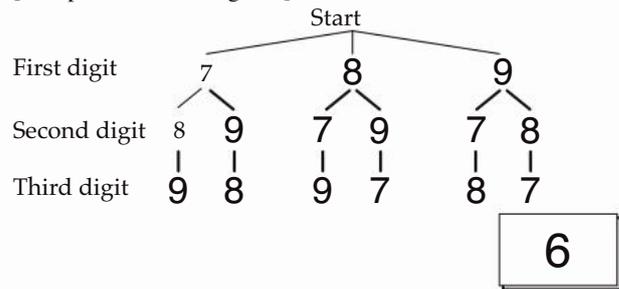


29. [Statistics]
Only during the 1900 Olympics in Paris has underwater swimming ever been considered an Olympic event. The winner was determined by the greatest distance covered. Which country won the event?

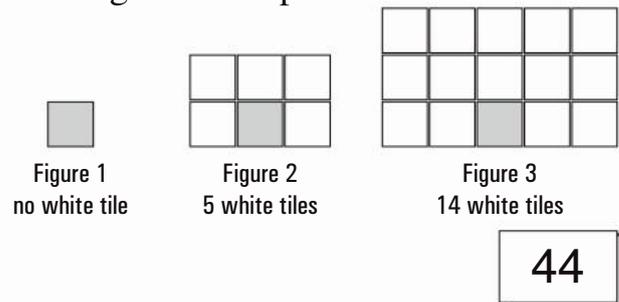


France

30. [Probability]
How many different 3-digit numbers can be made using the digits 7, 8 and 9 if the digits can be used only once?
[Complete the tree diagram.]



31. [Problem Solving 1]
How many white tiles will be in the fifth figure in the pattern?



32. [Problem Solving 2]
Find the value of the product:
 $\frac{15}{13} \times \frac{13}{11} \times \frac{11}{9} \times \frac{9}{7} \times \frac{7}{5} \times \frac{5}{3} =$

5

33. [Problem Solving 3]
The sum of the digits of 2015 is 8. How many whole numbers between 100 and 999 have 7 as the sum of their digits?

28



Test 2

Covering worksheets

1.5 - 1.8

Name:

1. [+ Whole Numbers to 10]

	15	21	9	24	16	23	10	2	27	8
+ 2	17	23	11	26	18	25	12	4	29	10

2. [- Whole Numbers to 10]

	25	10	14	9	23	22	6	8	21	17
- 4	21	6	10	5	19	18	2	4	17	13

3. [× Whole Numbers to 12]

	9	6	11	5	8	7	4	3	1	10
× 6	54	36	66	30	48	42	24	18	6	60

4. [÷ Whole Numbers to 12]

	6	24	18	20	16	22	10	12	8	14
÷ 2	3	12	9	10	8	11	5	6	4	7

5. [Large Number +, -]

$$4208 + 2519 = \boxed{6727}$$

12. [Decimals / Fractions / Percents]

Simplify $\frac{18}{24}$ $\boxed{\frac{3}{4}}$

17. [Exploring Numbers]

In which number does the digit 8 have greater value? A) 0.08 \boxed{A}
B) 0.908

6. [Large Number ×, ÷]

$$292 \times 400 = \boxed{116800}$$

13. [Integers]

The lowest point in Argentina is Salinas Chicas at -40 m and the highest is Cerro Aconcagua at 6960 m. What is the height difference?

$$\boxed{7000 \text{ m}}$$

18. [Multiples / Factors / Primes]

List all the factors of 18 in ascending order.

$$\boxed{1, 2, 3, 6, 9, 18}$$

7. [Decimal +, -]

$$9.25 - 3.54 = \boxed{5.71}$$

19. [Number Patterns]

Complete the table:

	Hair length (cm)				
children	0.5	1	1.5	2	2.5
adults	0.1	0.2	0.3	0.4	0.5

8. [Decimal ×, ÷]

$$4 \times 3.08 = \boxed{12.32}$$

14. [Rates / Ratios]

The cruising speed of a Boeing 747 is 910 km/h. At this rate how far can it travel in 4 hours?

$$\boxed{3640 \text{ km}}$$

20. [Expressions]

Simplify $4x - 2x + 3x$ $\boxed{5x}$

9. [Fraction +, -]

$$4\frac{1}{5} - 2\frac{3}{5} = \boxed{1\frac{3}{5}}$$

21. [Substitution]

If $v = -3$, find the value of $7v - 8$ $\boxed{-29}$

10. [Fraction ×, ÷]

$$\frac{1}{4} \text{ of } 60 \text{ m} = \boxed{15 \text{ m}}$$

15. [Indices / Square Roots]

$$10^4 = \boxed{10000}$$

11. [Percentages]

$$40\% \text{ of } \$800 = \boxed{\$320}$$

16. [Order of Operations]

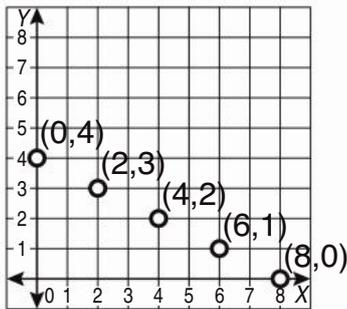
$$6 \times (11 + 9) = \boxed{120}$$

22. [Equations]

$$3 \times \boxed{-6} = -18$$

23. [Coordinates]

Draw circles at the following points: (0,4), (2,3), (4,2), (6,1), (8,0)

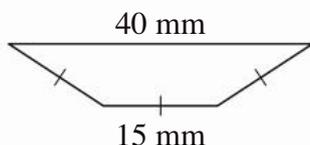


24. [Units of Measurement / Time]

4.3 kg = **4300** g

25. [Perimeter]

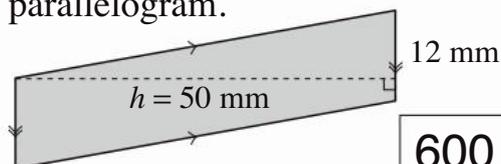
Calculate the perimeter of the trapezium.



85 mm

26. [Area / Volume]

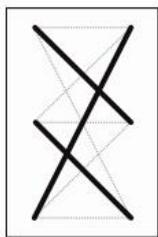
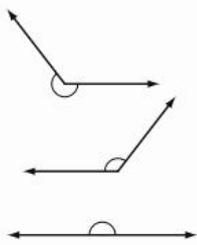
Using $A = bh$ find the area of the parallelogram.



600 mm²

27. [Shapes]

Match each angle to its description:



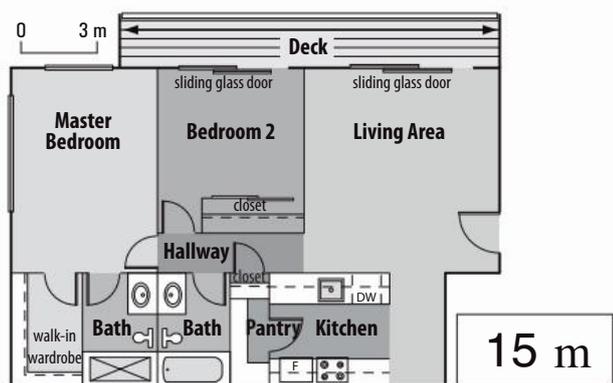
straight

reflex

obtuse

28. [Location / Transformation]

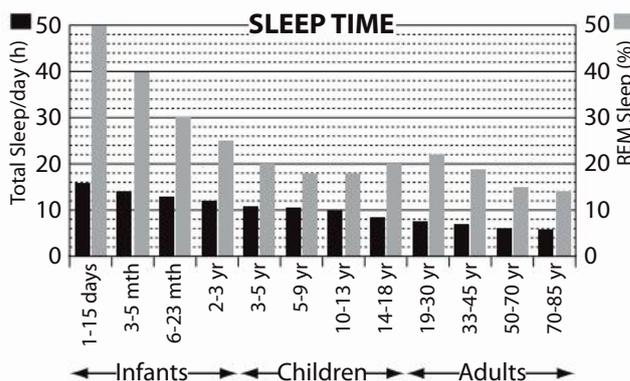
Using the scale, how long is the deck in front of the bedroom and living area?



15 m

29. [Statistics]

Which age group spends 22% of their 10 hours of sleep each day in REM (rapid eye movement) sleep?

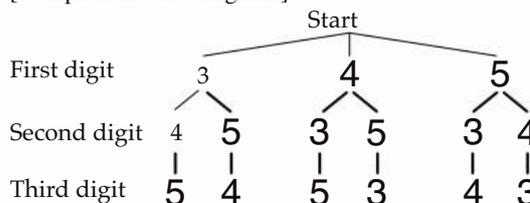


19-30 yr

30. [Probability]

How many different 3-digit numbers can be made using the digits 3, 4 and 5 if the digits can be used only once?

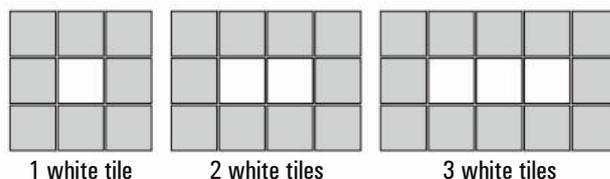
[Complete the tree diagram.]



6

31. [Problem Solving 1]

How many green tiles are needed to go around 10 white tiles, using the pattern shown?



26

32. [Problem Solving 2]

Find the value of the product:

$$\frac{8}{7} \times \frac{7}{6} \times \frac{6}{5} \times \frac{5}{4} \times \frac{4}{3} \times \frac{3}{2} =$$

4

33. [Problem Solving 3]

The sum of the digits of 2016 is 9. How many whole numbers between 100 and 999 have 6 as the sum of their digits?

21



Name:

1. [+ Whole Numbers to 10]

	13	12	17	14	1	15	6	9	10	8
+ 3	16	15	20	17	4	18	9	12	13	11

2. [- Whole Numbers to 10]

	17	12	20	19	16	15	13	11	18	14
- 10	7	2	10	9	6	5	3	1	8	4

3. [× Whole Numbers to 12]

	6	11	8	12	7	3	10	5	9	4
× 5	30	55	40	60	35	15	50	25	45	20

4. [÷ Whole Numbers to 12]

	108	54	81	45	99	72	63	36	27	90
÷ 9	12	6	9	5	11	8	7	4	3	10

5. [Large Number +,-]

$$6432 - 1509 = \boxed{4923}$$

6. [Large Number ×,÷]

$$4368 \div 6 = \boxed{728}$$

7. [Decimal +,-]

$$5.3 + 16.8 = \boxed{22.1}$$

8. [Decimal ×,÷]

$$618.6 \div 1000 = \boxed{0.6186}$$

9. [Fraction +,-]

$$3 - 1\frac{5}{6} = \boxed{1\frac{1}{6}}$$

10. [Fraction ×,÷]

$$3 \div \frac{2}{3} = \boxed{4\frac{1}{2}}$$

11. [Percentages]

$$25\% \text{ of } 160 = \boxed{40}$$

12. [Decimals / Fractions / Percents]

Complete the equivalent fractions:

$$\frac{4}{5} = \frac{12}{15} = \frac{48}{60}$$

13. [Integers]

Xi bought \$2500 worth of shares. After the first year he gained \$750 but after the second year he lost \$1250. What is the current value of Xi's shares?

$$\boxed{\$ 2000}$$

14. [Rates / Ratios]

The bottle nosed whale can dive at 27000 m per hour. At this rate how far can it dive in a minute?

$$\boxed{450 \text{ m}}$$

15. [Indices / Square Roots]

$$\sqrt{81} = \boxed{9}$$

16. [Order of Operations]

$$1 + (12 - 4) \times 3 = \boxed{25}$$

17. [Exploring Numbers]

Express in numerals: fifty-three thousand and eleven

$$\boxed{53011}$$

18. [Multiples / Factors / Primes]

What is the highest common factor (HCF) of 12 and 30?

$$\boxed{6}$$

19. [Number Patterns]

Complete the pattern: 12.8, 6.4, 3.2, 1.6,

$$\boxed{0.8, 0.4}$$

20. [Expressions]

Write as an expression: A number that is equal to 20 more than y

$$\boxed{y + 20}$$

21. [Substitution]

If $a = 44$ and $b = 11$, find the value of

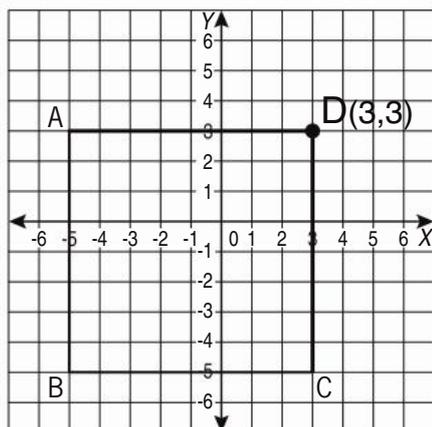
$$\frac{a}{b} = \boxed{4}$$

22. [Equations]

$$\frac{1}{8} \times \boxed{-40} = -5$$

23. [Coordinates]

What are the coordinates of point D that will make ABCD a square?



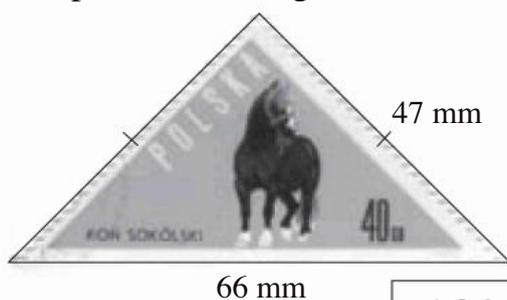
(3,3)

24. [Units of Measurement / Time]

900 m = 0.9 km

25. [Perimeter]

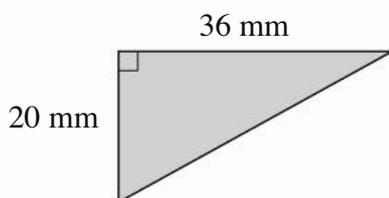
What is the perimeter of this Polish stamp valued at 40 groszy?



160 mm

26. [Area / Volume]

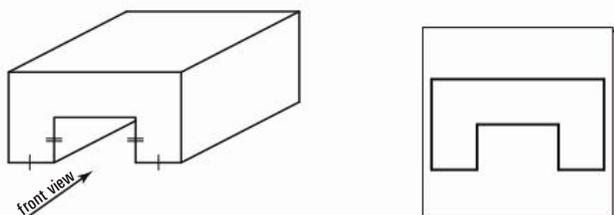
Using $A = \frac{1}{2}bh$ find the area of the right-angled triangle.



360 mm²

27. [Shapes]

Sketch the front view of this solid.



28. [Location / Transformation]

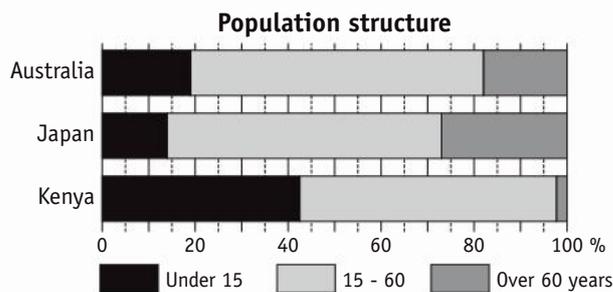
By how many degrees must this shape be rotated to first match the original position?



45°

29. [Statistics]

Which of the countries shown has approximately 27% of their population over the age of 60 years?



Japan

30. [Probability]

If a letter tile is chosen at random, find the probability of choosing letter E.

[Give your answer as a fraction.]



$\frac{3}{11}$

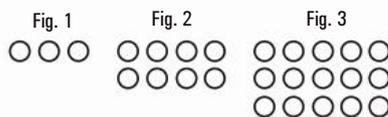
31. [Problem Solving 1]

How many numbers between 1 and 90 are divisible by 4?

22

32. [Problem Solving 2]

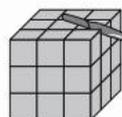
If this pattern is continued, how many dots will there be in figure 100?



10200

33. [Problem Solving 3]

A solid cube is painted on all 6 faces, and then it is sliced into 27 smaller cubes. How many of these smaller cubes have no paint on them?



1



Name:

1. [+ Whole Numbers to 10]

	10	7	9	13	4	8	2	6	18	11
+ 5	15	12	14	18	9	13	7	11	23	16

2. [- Whole Numbers to 10]

	11	14	7	19	12	10	15	8	16	13
- 6	5	8	1	13	6	4	9	2	10	7

3. [× Whole Numbers to 12]

	11	7	9	3	12	5	4	10	6	8
× 2	22	14	18	6	24	10	8	20	12	16

4. [÷ Whole Numbers to 12]

	12	21	9	30	18	36	24	15	33	27
÷ 3	4	7	3	10	6	12	8	5	11	9

5. [Large Number +,-]

$$5743 - 2760 = \boxed{2983}$$

6. [Large Number ×,÷]

$$4158 \div 7 = \boxed{594}$$

7. [Decimal +,-]

$$46.7 + 9.5 = \boxed{56.2}$$

8. [Decimal ×,÷]

$$275.3 \div 1000 = \boxed{\$ 900}$$

9. [Fraction +,-]

$$2 - 1\frac{1}{4} = \boxed{\frac{3}{4}}$$

10. [Fraction ×,÷]

$$3 \div \frac{2}{5} = \boxed{7\frac{1}{2}}$$

11. [Percentages]

$$20\% \text{ of } 130 = \boxed{26}$$

12. [Decimals / Fractions / Percents]

Complete the equivalent fractions:

$$\frac{3}{4} = \frac{15}{\boxed{20}} = \frac{\boxed{45}}{60}$$

13. [Integers]

Lauren bought \$1500 worth of shares. After the first year she lost \$850 but after the second year she gained \$250. What is the current value of Lauren's shares?

$$\boxed{\$ 900}$$

14. [Rates / Ratios]

The golden eagle can dive at 300 km/h. At this rate how far can it dive in a minute?

$$\boxed{5 \text{ km}}$$

15. [Indices / Square Roots]

$$\sqrt{64} = \boxed{8}$$

16. [Order of Operations]

$$5 + (11 - 5) \times 3 = \boxed{23}$$

17. [Exploring Numbers]

Express in numerals: thirty-six thousand and eighteen

$$\boxed{36018}$$

18. [Multiples / Factors / Primes]

What is the highest common factor (HCF) of 16 and 36?

$$\boxed{4}$$

19. [Number Patterns]

Complete the pattern: 9.6, 4.8, 2.4, 1.2,

$$\boxed{0.6, 0.3}$$

20. [Expressions]

Write as an expression: A number that is equal to 9 less than x

$$\boxed{x - 9}$$

21. [Substitution]

If $d = 45$ and $e = 5$, find the value of $\frac{d}{e}$

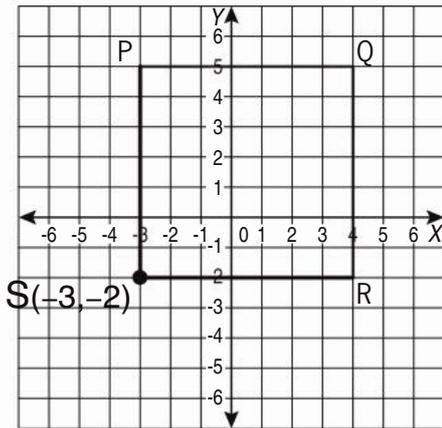
$$\boxed{9}$$

22. [Equations]

$$\frac{1}{9} \times \boxed{-36} = -4$$

23. [Coordinates]

What are the coordinates of point S that will make PQRS a square?



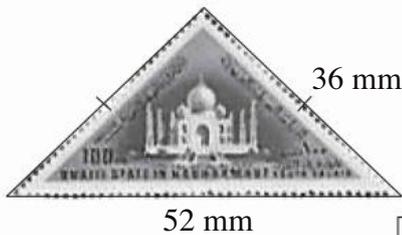
(-3, -2)

24. [Units of Measurement / Time]

680 cm = **6.8** m

25. [Perimeter]

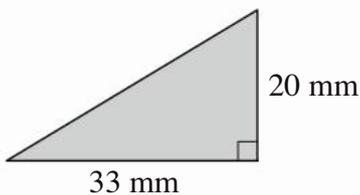
What is the perimeter of this Indian stamp?



124 mm

26. [Area / Volume]

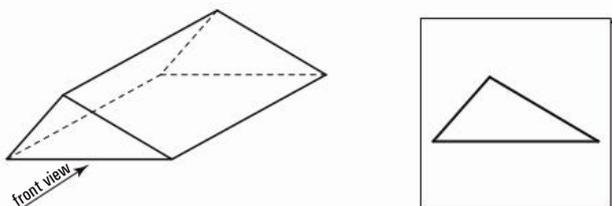
Using $A = \frac{1}{2}bh$ find the area of the right-angled triangle.



330 mm²

27. [Shapes]

Sketch the front view of this solid.



28. [Location / Transformation]

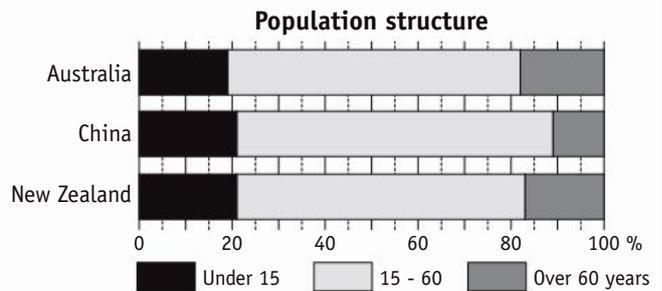
By how many degrees must this shape be rotated to first match the original position?



180°

29. [Statistics]

Which of the countries shown has approximately 12% of their population over the age of 60 years?



China

30. [Probability]

If a letter tile is chosen at random, find the probability of choosing a vowel.

[Give your answer as a fraction in simplest form.]



31. [Problem Solving 1]

How many numbers between 1 and 70 are divisible by 11?

6

32. [Problem Solving 2]

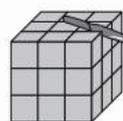
In the diagram below, thirteen toothpicks have been used to make three terrace houses. Find the number of extra toothpicks required to extend the pattern to nine houses.



24

33. [Problem Solving 3]

A solid cube is painted on all 6 faces, and then it is sliced into 27 smaller cubes. How many of these smaller cubes are painted on only two faces?



12



Test 4

Covering worksheets

2.5 - 2.8

Name:

1. [+ Whole Numbers to 10]

	21	4	22	8	17	23	10	9	15	16
+ 7	28	11	29	15	24	30	17	16	22	23

2. [- Whole Numbers to 10]

	24	21	16	9	32	10	25	13	48	17
- 9	15	12	7	0	23	1	16	4	39	8

3. [× Whole Numbers to 12]

	4	11	3	6	10	8	7	9	12	5
× 11	44	121	33	66	110	88	77	99	132	55

4. [÷ Whole Numbers to 12]

	18	30	66	42	48	54	72	36	24	60
÷ 6	3	5	11	7	8	9	12	6	4	10

5. [Large Number +, -]

$$5472 + 2683 = \boxed{8155}$$

6. [Large Number ×, ÷]

$$896 \times 2 = \boxed{1792}$$

7. [Decimal +, -]

$$46.2 - 8.5 = \boxed{37.7}$$

8. [Decimal ×, ÷]

$$2.2 \times 0.8 = \boxed{1.76}$$

9. [Fraction +, -]

$$\frac{5}{8} + \frac{1}{8} = \boxed{\frac{3}{4}}$$

10. [Fraction ×, ÷]

$$\frac{1}{4} \times \frac{3}{5} = \boxed{\frac{3}{20}}$$

11. [Percentages]

If a \$4000 ring is reduced by 40%, what is the sale price? $\boxed{\$2400}$

12. [Decimals / Fractions / Percents]

In Norway, 16% of workers are employed for more than 40 hours per week. Write this percentage as a decimal. $\boxed{0.16}$

13. [Integers]

Nitrogen melts at -210°C . Heat it a further 14°C , and it boils. At what temperature does nitrogen boil? $\boxed{-196^{\circ}\text{C}}$

14. [Rates / Ratios]

Simplify the ratio $21 : 15 : 12$ $\boxed{7 : 5 : 4}$

15. [Indices / Square Roots]

$$40^2 = \boxed{1600}$$

16. [Order of Operations]

$$8 - (21 \div 3 - 6) = \boxed{7}$$

17. [Exploring Numbers]

Round 37009 to the nearest thousand. $\boxed{37000}$

18. [Multiples / Factors / Primes]

List all the prime numbers between 0 and 15. $\boxed{2, 3, 5, 7, 11, 13}$

19. [Number Patterns]

Complete the pattern: 3, 5, 9, 15, 23, $\boxed{33, 45}$

20. [Expressions]

Choose the like terms: $r, 2rs, rs, 3s$ $\boxed{2rs, rs}$

21. [Substitution]

If $q = 5$ and $r = 4$, find the value of $-2q + 4r$ $\boxed{6}$

22. [Equations]

$$30 - 6 \times \boxed{2} = 18$$

23. [Coordinates]

Complete the table of values for the linear function $y = 6x$

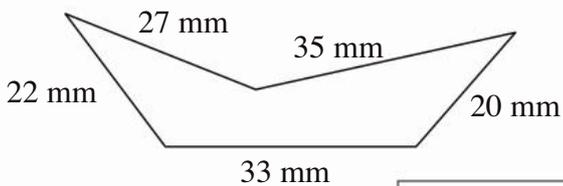
x	$y = 6x$	y
0	$y = 6 \times 0 = 0$	0
1	$y = 6 \times 1 = 6$	6
2	$y = 6 \times 2 = 12$	12
3	$y = 6 \times 3 = 18$	18
4	$y = 6 \times 4 = 24$	24
5	$y = 6 \times 5 = 30$	30

24. [Units of Measurement / Time]

12 500 mL = 12.5 L

25. [Perimeter]

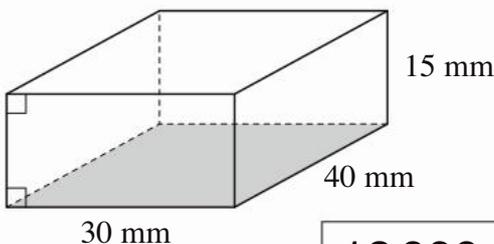
Calculate the perimeter of the polygon.



137 mm

26. [Area / Volume]

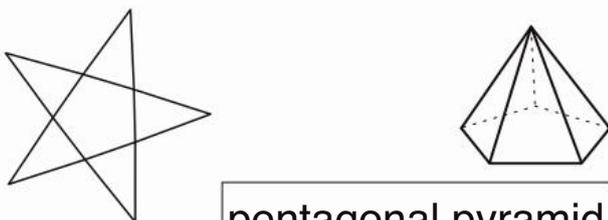
Using $V = lwh$ find the volume of the rectangular prism.



18000 mm³

27. [Shapes]

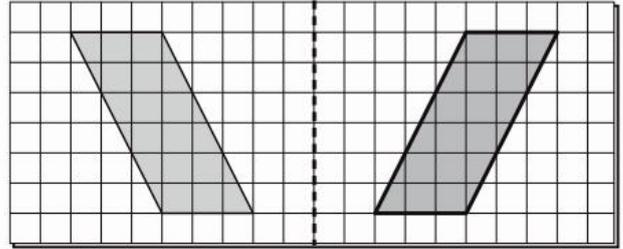
What three-dimensional shape can this net be used to make?



pentagonal pyramid

28. [Location / Transformation]

Redraw this parallelogram after reflecting it in the vertical dotted line.



29. [Statistics]

This table shows the average lifespan of various animals. Find the mean (average) of the data.

ANIMAL LIFESPANS - years

gorilla	kangaroo	pig	sheep	lion
6	7	10	12	15

10

30. [Probability]

A spinner is equally likely to stop on any of the regions numbered 1 to 20. Find the probability of the spinner stopping on a multiple of 4.

[Give your answer as a fraction in simplest form.]

$\frac{1}{4}$

31. [Problem Solving 1]

Two positive numbers have a difference of 5 and a product of 36. Find the two numbers.

4 and 9

32. [Problem Solving 2]

Complete the multiplication table.

×	2	7	8
3	6	21	24
6	12	42	48
9	18	63	72

33. [Problem Solving 3]

The number 54 can be expressed as the sum of two or more consecutive, positive integers in three different ways. One such sequence begins with 12:

$$12 + 13 + 14 + 15 = 54$$

With what number does each of the other two sequences begin?

2 and 17

MATHS MATE



Test 4

Covering worksheets

2.5 - 2.8

Name:

1. [+ Whole Numbers to 10]

	16	21	12	9	15	17	23	14	10	18
+ 6	22	27	18	15	21	23	29	20	16	24

2. [- Whole Numbers to 10]

	17	29	23	10	24	26	18	25	12	21
- 8	9	21	15	2	16	18	10	17	4	13

3. [× Whole Numbers to 12]

	10	11	4	5	8	12	7	9	3	6
× 12	120	132	48	60	96	144	84	108	36	72

4. [+ Whole Numbers to 12]

	25	50	35	20	55	15	45	60	30	40
÷ 5	5	10	7	4	11	3	9	12	6	8

5. [Large Number +, -]

$$4930 + 2785 = \boxed{7715}$$

6. [Large Number ×, ÷]

$$758 \times 3 = \boxed{2274}$$

7. [Decimal +, -]

$$53.7 - 9.8 = \boxed{43.9}$$

8. [Decimal ×, ÷]

$$1.5 \times 0.7 = \boxed{1.05}$$

9. [Fraction +, -]

$$\frac{2}{9} + \frac{1}{9} = \boxed{\frac{3}{9}}$$

10. [Fraction ×, ÷]

$$\frac{3}{8} \times \frac{1}{5} = \boxed{\frac{3}{40}}$$

11. [Percentages]

If a \$30 000 car is reduced by 30%, what is the sale price? $\boxed{\$ 21\ 000}$

12. [Decimals / Fractions / Percents]

In Sweden, 62% of workers are employed for more than 40 hours per week. Write this percentage as a decimal. $\boxed{0.62}$

13. [Integers]

Hydrogen melts at -259°C . Warm it a further 6°C , and it boils. At what temperature does hydrogen boil? $\boxed{-253^{\circ}\text{C}}$

14. [Rates / Ratios]

Simplify the ratio $16 : 24 : 12$ $\boxed{4 : 6 : 3}$

15. [Indices / Square Roots]

$$90^2 = \boxed{8100}$$

16. [Order of Operations]

$$20 - (23 - 4 \times 2) = \boxed{5}$$

17. [Exploring Numbers]

Round 21 610 to the nearest thousand. $\boxed{22\ 000}$

18. [Multiples / Factors / Primes]

List all the prime numbers between 15 and 30. $\boxed{17, 19, 23, 29}$

19. [Number Patterns]

Complete the pattern:
2, 5, 10, 17, 26, $\boxed{37, 50}$

20. [Expressions]

Choose the like terms:
 $ef, 4e, 2f, 3ef$

$\boxed{ef, 3ef}$

21. [Substitution]

If $i = 5$ and $j = 4$, find the value of $-3i + 6j$ $\boxed{9}$

22. [Equations]

$$45 - 7 \times \boxed{5} = 10$$

23. [Coordinates]

Complete the table of values for the linear function $y = 8x$

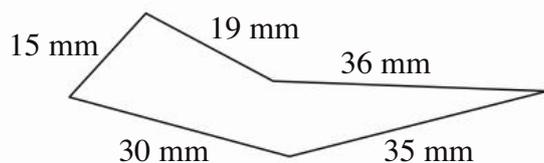
x	$y = 8x$	y
0	$y = 8 \times 0 = 0$	0
1	$y = 8 \times 1 = 8$	8
2	$y = 8 \times 2 = 16$	16
3	$y = 8 \times 3 = 24$	24
4	$y = 8 \times 4 = 32$	32
5	$y = 8 \times 5 = 40$	40

24. [Units of Measurement / Time]

300 mL = 0.3 L

25. [Perimeter]

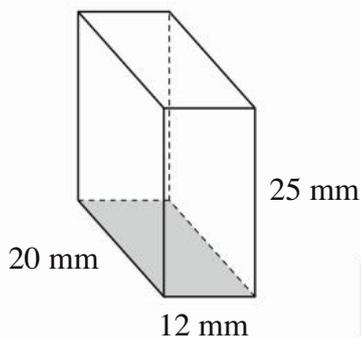
Calculate the perimeter of the polygon.



135 mm

26. [Area / Volume]

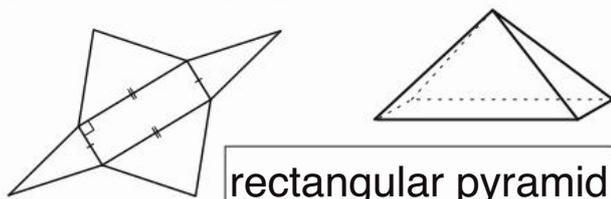
Using $V = lwh$ find the volume of the rectangular prism.



6000 mm³

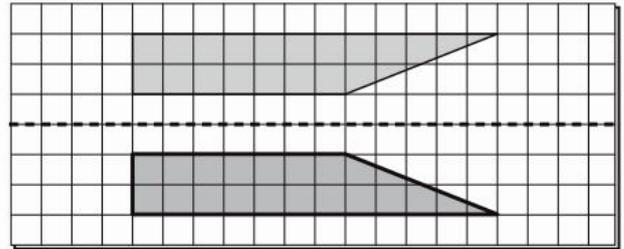
27. [Shapes]

What three-dimensional shape can this net be used to make?



28. [Location / Transformation]

Redraw this trapezium after reflecting it in the horizontal dotted line.



29. [Statistics]

This table shows the average lifespan of some animals. Find the mean (average) of the data.

ANIMAL LIFESPANS - years

wolf	horse	polar bear	elephant	turtle
10	20	20	40	100

38

30. [Probability]

A set of twenty cards is numbered 1 to 20. If a card is picked at random, what is the probability of choosing a factor of 18? [Give your answer as a fraction in simplest form.]

$\frac{3}{10}$

31. [Problem Solving 1]

Two positive numbers have a difference of 8 and a product of 48. Find the two numbers.

4 and 12

32. [Problem Solving 2]

Complete the multiplication table.

×	7	9	6
4	28	36	24
8	56	72	48
12	84	108	72

33. [Problem Solving 3]

The number 45 can be expressed as the sum of two or more consecutive, positive integers in five different ways. One such sequence begins with 22:

$22 + 23 = 45$

With what number does each of the other four sequences begin?

1, 5, 7 & 14

MATHS MATE



Test 5

Covering worksheets

3.1 - 3.4

Name:

1. [+ Whole Numbers to 10]

	13	-7	4	8	12	-19	10	5	16	11
+ 8	21	1	12	16	20	-11	18	13	24	19

2. [- Whole Numbers to 10]

	16	3	18	10	15	22	19	21	17	-14
- 7	9	-4	11	3	8	15	12	14	10	-21

3. [× Whole Numbers to 12]

	8	5	11	2	7	3	10	6	4	9
× 6	48	30	66	12	42	18	60	36	24	54

4. [+ Whole Numbers to 12]

	72	60	132	108	36	84	120	96	48	144
÷ 12	6	5	11	9	3	7	10	8	4	12

5. [Large Number +,-]

$$39000 - 2745 =$$

36255

6. [Large Number ×,+]

$$1092 \times 15 =$$

16380

7. [Decimal +,-]

$$29.58 + 37.46 =$$

67.04

8. [Decimal ×,+]

$$1.4 \div 0.2 =$$

7

9. [Fraction +,-]

$$2\frac{7}{10} + \frac{9}{10} =$$

3 $\frac{3}{5}$

10. [Fraction ×,+]

$$\frac{8}{9} \div 4 =$$

$\frac{2}{9}$

11. [Percentages]

A bracelet costs \$4000. Which is the better deal?

- A) 5% off
- B) \$100 cash back

A

12. [Decimals / Fractions / Percents]

Write 0.2 as a fraction in simplest form.

$\frac{1}{5}$

13. [Integers]

$$-3 + (-3) =$$

-6

14. [Rates / Ratios]

Complete the equivalent ratios:

$$24 : 15 = \mathbf{8} : 5$$

15. [Indices / Square Roots]

$$\sqrt{4900} =$$

70

16. [Order of Operations]

$$3 + (6 - 2)^2 =$$

19

17. [Exploring Numbers]

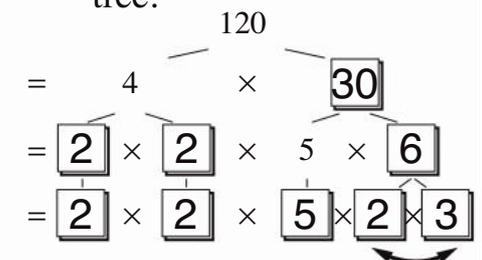
Which fraction has greater value?

$$\frac{3}{5} \text{ or } \frac{4}{7}$$

$\frac{3}{5}$

18. [Multiples / Factors / Primes]

Express 120 as a product of prime numbers by completing the factor tree.



19. [Number Patterns]

Complete the pattern:

$$23, 23, 22, 20, 17, \mathbf{13}, \mathbf{8}$$

20. [Expressions]

The car travels 20 km/h over the speed limit of v km/h. How fast is the car travelling? [Express your answer in terms of v .]

$v + 20$

21. [Substitution]

Use $v = \frac{d}{t}$ to find the speed (v) where $d = 240$ and $t = 3$

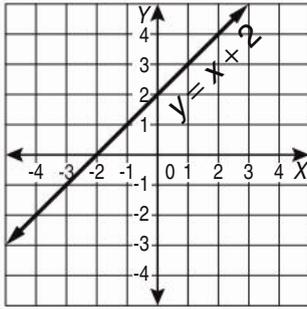
80

22. [Equations]

$$1.7 + \mathbf{0.7} = 2.4$$

23. [Coordinates]

Draw a line through all the points where the y -coordinate is 2 more than the x -coordinate (line of equation $y = x + 2$).

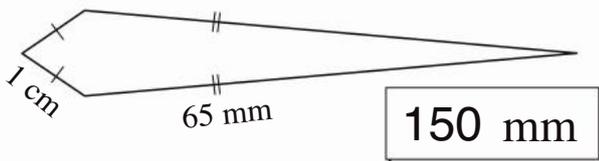


24. [Units of Measurement / Time]

3 min 45 s = 225 s

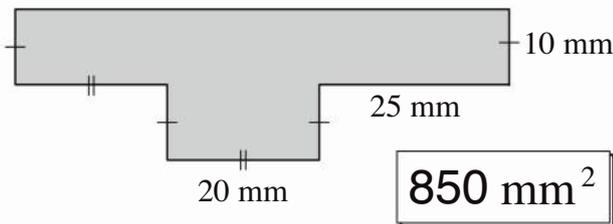
25. [Perimeter]

Calculate the perimeter of the kite in millimetres.



26. [Area / Volume]

Find the area of the polygon.



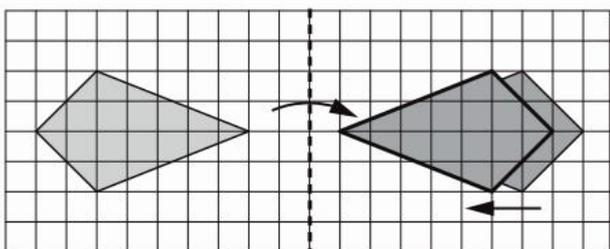
27. [Shapes]

Find the value of x° .



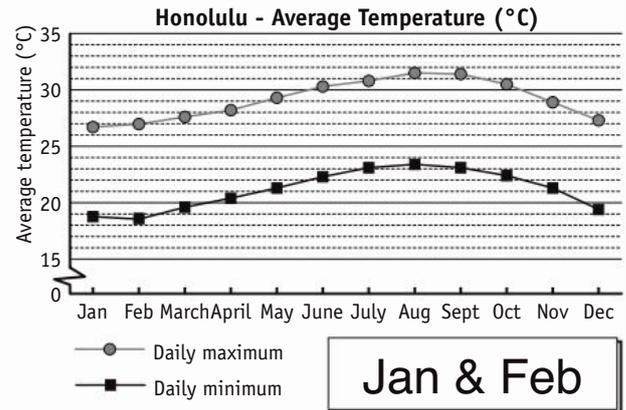
28. [Location / Transformation]

Redraw this kite after reflecting it in the vertical dotted line and then translating it 1 unit to the left.



29. [Statistics]

Between which 2 months did the maximum temperature increase and the minimum temperature decrease?



30. [Probability]

Which has a 50% chance of success?

- A) drawing a spade from a deck of 52 playing cards
 - B) turning 'heads' on a flipped coin
 - C) rolling a multiple of 3 on a die
- B

31. [Problem Solving 1]

The base 4 number 213_4 is equivalent to:

$$\begin{aligned} & 2 \times 4^2 + 1 \times 4^1 + 3 \times 4^0 \\ & = 32 + 4 + 3 \\ & = 39 \text{ in base 10 } [3 \times 10^1 + 9 \times 10^0] \end{aligned}$$

What is 302_4 equal to in base 10?

50

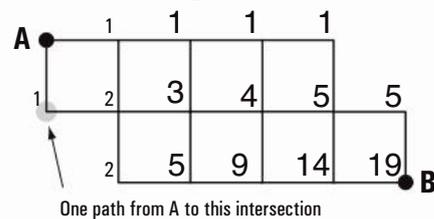
32. [Problem Solving 2]

Ms Harrison fills her petrol tank every six days. Mr Thai fills his petrol tank every eight days. If they both filled their tanks today, how many days until they will next be filling their tanks on the same day?

24

33. [Problem Solving 3]

You are to go from A to B, always moving right or down along the lines. On how many different paths can you go? [The number of paths from A to various intersections has been included.]



19



Test 5

Covering worksheets

3.1 - 3.4

Name:

1. [+ Whole Numbers to 10]

	8	11	-3	7	12	19	5	14	-30	6
+ 9	17	20	6	16	21	28	14	23	-21	15

2. [- Whole Numbers to 10]

	23	6	4	7	20	9	22	-8	21	15
- 5	18	1	-1	2	15	4	17	-13	16	10

3. [× Whole Numbers to 12]

	7	3	10	8	1	6	9	4	12	5
× 8	56	24	80	64	8	48	72	32	96	40

4. [+ Whole Numbers to 12]

	35	70	49	84	63	28	42	21	77	56
÷ 7	5	10	7	12	9	4	6	3	11	8

5. [Large Number +,-]

$55\,000 - 2426 =$

52 574

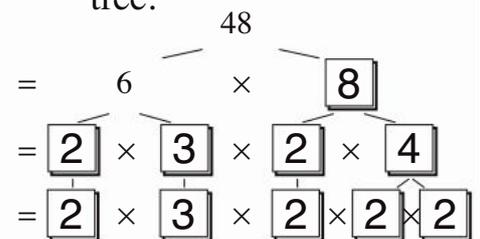
12. [Decimals / Fractions / Percents]

Write 0.05 as a fraction in simplest form.

$\frac{1}{20}$

18. [Multiples / Factors / Primes]

Express 48 as a product of prime numbers by completing the factor tree.



6. [Large Number ×,÷]

$2075 \times 22 =$

45 650

13. [Integers]

$-4 + (-3) =$

-7

7. [Decimal +,-]

$33.74 + 29.28 =$

63.02

14. [Rates / Ratios]

Complete the equivalent ratios:

$42 : 60 = 10 :$

7

19. [Number Patterns]

Complete the pattern:

57, 56, 54, 51, 47, **42, 36**

8. [Decimal ×,÷]

$1.6 \div 0.4 =$

4

9. [Fraction +,-]

$1\frac{5}{9} + \frac{7}{9} =$

$2\frac{1}{3}$

15. [Indices / Square Roots]

$\sqrt{6400} =$

80

20. [Expressions]

Julie is x years old. How old will she be in 10 years time? [Express your answer in terms of x .]

$x + 10$

10. [Fraction ×,÷]

$\frac{9}{10} \div 3 =$

$\frac{3}{10}$

16. [Order of Operations]

$5 + (8 - 5)^2 =$

14

21. [Substitution]

Use $t = \frac{d}{v}$ to find the time (t) where $d = 120$ and $v = 60$

2

11. [Percentages]

A lamp costs \$300. Which is the better deal?

- A) 15% off
- B) \$50 cash back

B

17. [Exploring Numbers]

Which fraction has greater value?

$\frac{4}{5}$ or $\frac{5}{6}$

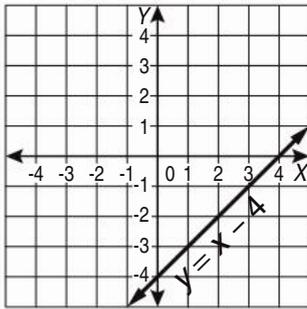
$\frac{5}{6}$

22. [Equations]

$**0.6** + 1.8 = 2.4$

23. [Coordinates]

Draw a line through all the points where the x -coordinate is 4 more than the y -coordinate (line of equation $y = x - 4$).

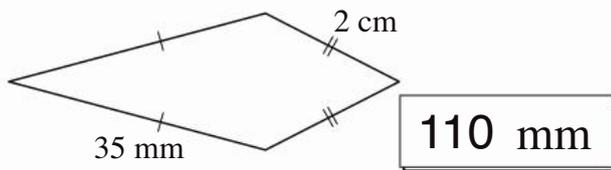


24. [Units of Measurement / Time]

3 h 15 min = **195** min

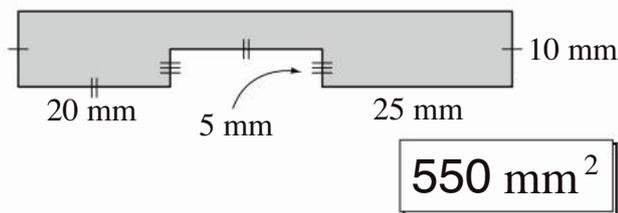
25. [Perimeter]

Calculate the perimeter of the kite in millimetres.



26. [Area / Volume]

Find the area of the polygon.



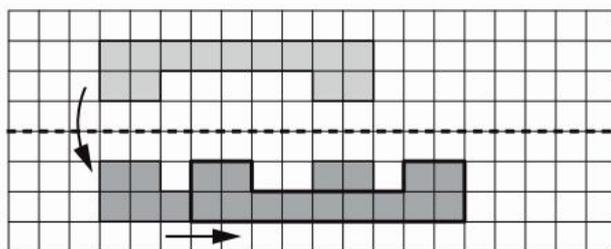
27. [Shapes]

Find the value of x° .



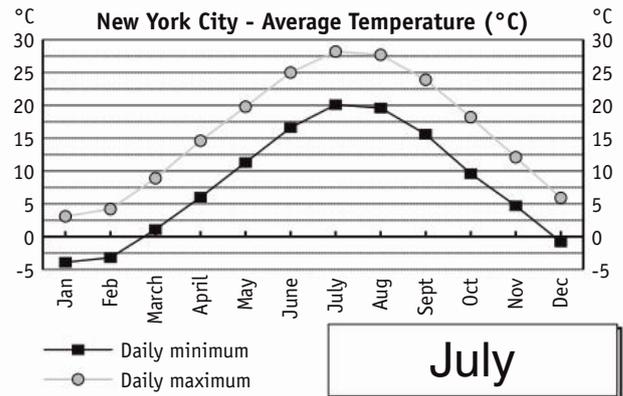
28. [Location / Transformation]

Redraw this shape after reflecting it in the horizontal dotted line and then translating it 3 units to the right.



29. [Statistics]

In which month are the highest daily maximum and minimum average temperatures recorded?



30. [Probability]

Which event is most unlikely to happen?

- A) drawing a black card from a deck of 52 playing cards
 - B) turning 'tails' on a tossed coin
 - C) selecting a multiple of 5 from numbers 10 to 19
- C**

31. [Problem Solving 1]

The base 4 number 312_4 is equivalent to:

$$\begin{aligned}
 & 3 \times 4^2 + 1 \times 4^1 + 2 \times 4^0 \\
 & = 48 + 4 + 2 \\
 & = 54 \text{ in base 10 } [5 \times 10^1 + 4 \times 10^0]
 \end{aligned}$$

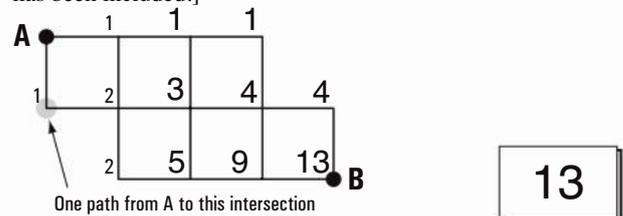
What is 132_4 equal to in base 10? **30**

32. [Problem Solving 2]

Two cannons are fired together at 8:00 am. One cannon then fires again every 120 minutes while the other cannon continues to fire every 75 minutes. At what time will the two cannons both fire at the same time again? **6:00 pm**

33. [Problem Solving 3]

You are to go from A to B, always moving right or down along the lines. On how many different paths can you go? [The number of paths from A to various intersections has been included.]





Name:

1. [+ Whole Numbers to 10]

	5	8	13	20	-14	19	12	26	-1	17
+ 5	10	13	18	25	-9	24	17	31	4	22

2. [- Whole Numbers to 10]

	14	17	1	-8	12	29	15	10	-13	16
- 4	10	13	-3	-12	8	25	11	6	-17	12

3. [× Whole Numbers to 12]

	8	12	5	9	4	11	7	3	6	10
× 7	56	84	35	63	28	77	49	21	42	70

4. [+ Whole Numbers to 12]

	77	44	132	110	55	99	33	66	121	88
÷ 11	7	4	12	10	5	9	3	6	11	8

5. [Large Number +,-]

$$76\,606 + 4726 =$$

81 332

12. [Decimals / Fractions / Percents]

In 2017, an estimated 22% of Australians had a convict ancestor. Write this percentage as a fraction in simplest form.

$\frac{11}{50}$

18. [Multiples / Factors / Primes]

Express 21 as a product of its prime factors.

$21 = 3 \times 7$

6. [Large Number ×,÷]

$$52\,800 \div 11 =$$

4800

13. [Integers]

$$-7 - (-7) =$$

0

19. [Number Patterns]

Complete the pattern:

20, 14, 8, 2, -4, **$-\underline{10}, -\underline{16}$**

7. [Decimal +,-]

$$86.31 - 8.07 =$$

78.24

14. [Rates / Ratios]

Which is the best buy?

- A) a 200 g energy drink can at \$4.00
- B) a 750 g energy drink can at \$12.00

B

20. [Expressions]

Simplify $e + e - e + f$

$e + f$

9. [Fraction +,-]

$$\frac{2}{3} + \frac{4}{15} =$$

$\frac{14}{15}$

15. [Indices / Square Roots]

$$2^4 =$$

16

21. [Substitution]

If $e = 3$, find the value of $2e^2 - e$

15

10. [Fraction ×,÷]

$$\frac{7}{8} \times \frac{2}{5} =$$

$\frac{7}{20}$

16. [Order of Operations]

$$8 \div 2^2 + 22 - 7 =$$

17

11. [Percentages]

$$250\% \text{ of } 60 =$$

150

17. [Exploring Numbers]

Round 0.9408 to three decimal places.

0.941

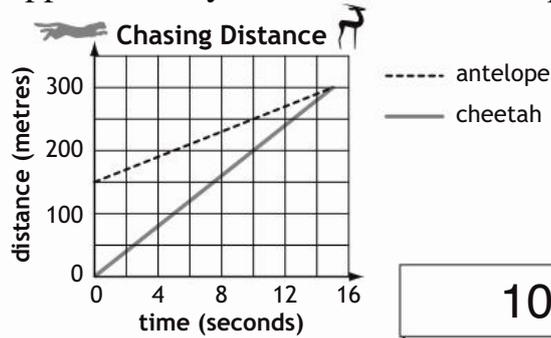
22. [Equations]

Solve for x : $12 - x = 4$

$x = 8$

23. [Coordinates]

A cheetah is chasing an antelope. After how many seconds is the cheetah approximately 50 metres behind its prey?



10 s

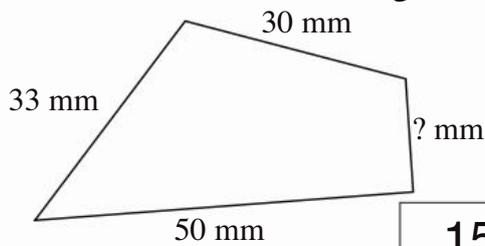
24. [Units of Measurement / Time]

In a full grown rye plant, the combined length of the roots may reach 613 km. Express this in metres.

613 000 m

25. [Perimeter]

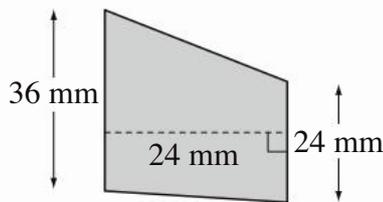
The perimeter of this quadrilateral is 128 mm. Find the missing side length.



15 mm

26. [Area / Volume]

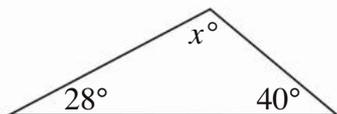
Using $A = \frac{1}{2}(a + b)h$ find the area of the trapezium.



720 mm²

27. [Shapes]

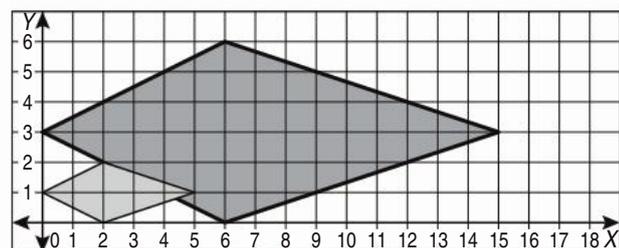
Find the value of x° .



112°

28. [Location / Transformation]

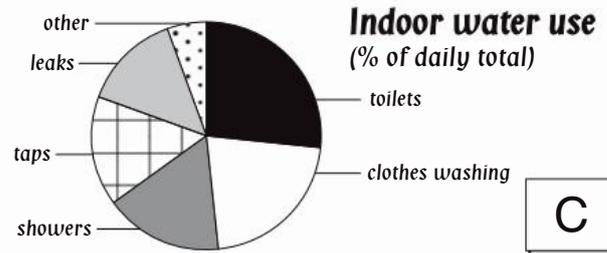
Redraw the kite after multiplying the coordinates of its vertices by 3.



29. [Statistics]

Approximately what percentage of indoor water usage is accounted for by toilets?

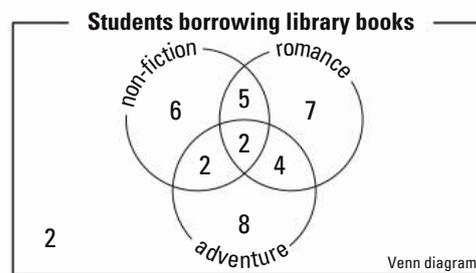
- A) 5%
- B) 15%
- C) 25%
- D) 50%



C

30. [Probability]

What is the probability that a student chosen at random borrowed an adventure book? [Give your answer as a fraction in simplest form.]



4/9

31. [Problem Solving 1]

What is the smallest positive integer, greater than 1, which when divided by 5 or 6 leaves a remainder of 1?

31

32. [Problem Solving 2]

A fence, 3 sections long, requires 4 posts and 6 rails, as shown. How many posts and rails are required to build a fence 20 sections long?



posts = 21 rails = 40

33. [Problem Solving 3]

A 3rd grade maths test included this rather tough challenge. Can you solve it?

If $1 * 4 = 5$ All 3 parts add to 10
 $2 * 2 = 6$ or $a * b = 10 - (a + b)$
 $3 * 5 = 2$
 and $3 * 6 = 1$ find the value of
 $4 * 4 = ?$

2



Name:

1. [+ Whole Numbers to 10]

	10	14	9	12	-15	18	-1	7	13	6
+ 7	17	21	16	19	-8	25	6	14	20	13

2. [- Whole Numbers to 10]

	13	22	10	-1	17	8	16	24	9	5
- 9	4	13	1	-10	8	-1	7	15	0	-4

3. [× Whole Numbers to 12]

	1	6	3	10	4	8	5	7	12	9
× 11	11	66	33	110	44	88	55	77	132	99

4. [+ Whole Numbers to 12]

	80	32	96	48	40	24	88	72	56	64
÷ 8	10	4	12	6	5	3	11	9	7	8

5. [Large Number +, -]

$$24930 + 7578 =$$

32508

6. [Large Number ×, ÷]

$$58800 \div 12 =$$

4900

7. [Decimal +, -]

$$35.42 - 9.04 =$$

26.38

8. [Decimal ×, ÷]

$$0.27 \div 0.3 =$$

0.9

9. [Fraction +, -]

$$\frac{5}{18} + \frac{1}{3} =$$

$\frac{11}{18}$

10. [Fraction ×, ÷]

$$\frac{3}{8} \times \frac{4}{5} =$$

$\frac{3}{10}$

11. [Percentages]

$$110\% \text{ of } 50 =$$

55

12. [Decimals / Fractions / Percents]

In Iceland 66% of university degrees are earned by women. Write this percentage as a fraction in simplest form.

$\frac{33}{50}$

13. [Integers]

$$-8 - (-5) =$$

-3

14. [Rates / Ratios]

Which is the best buy?

- A) a 400 g jar of honey at \$9.60
- B) a 150 g jar of honey at \$3.30

B

15. [Indices / Square Roots]

$$5^3 =$$

125

16. [Order of Operations]

$$4 \times 5 - 2 \times 3^2 =$$

2

17. [Exploring Numbers]

Round 5.0644 to three decimal places.

5.064

18. [Multiples / Factors / Primes]

Express 33 as a product of its prime factors.

$33 = 3 \times 11$

19. [Number Patterns]

Complete the pattern:

25, 18, 11, 4, -3, **$-10, -17$**

20. [Expressions]

Simplify $g + g + g - h$

$3g - h$

21. [Substitution]

If $m = 2$, find the value of $3m^2 - m$

10

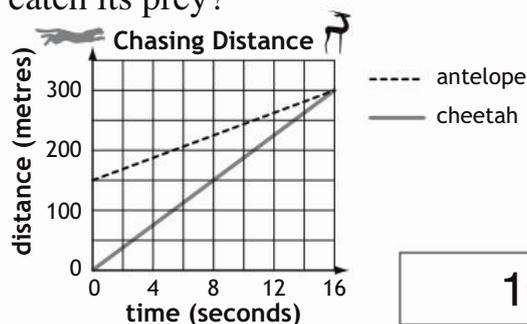
22. [Equations]

Solve for x : $20 - x = 18$

$x = 2$

23. [Coordinates]

A cheetah is chasing an antelope. After how many seconds does the cheetah catch its prey?



16 s

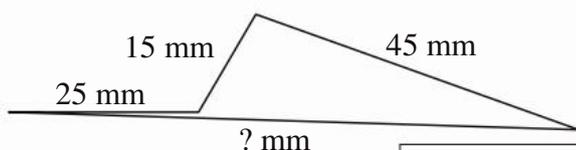
24. [Units of Measurement / Time]

Measuring from base to peak, Mauna Kea (Hawaii) is the tallest mountain on earth. It rises 10 200 m from the depths of the ocean. Express this in kilometres.

10.2 km

25. [Perimeter]

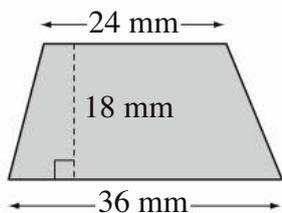
The perimeter of this quadrilateral is 160 mm. Find the missing side length.



75 mm

26. [Area / Volume]

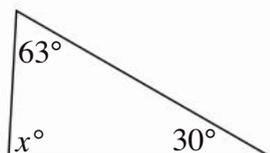
Using $A = \frac{1}{2}(a + b)h$ find the area of the trapezium.



540 mm²

27. [Shapes]

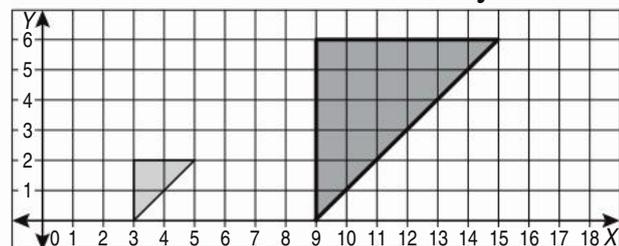
Find the value of x° .



87°

28. [Location / Transformation]

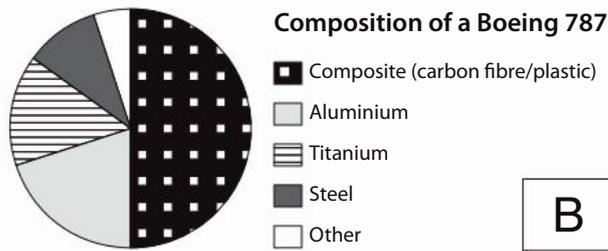
Redraw the triangle after multiplying the coordinates of its vertices by 3.



29. [Statistics]

Approximately what percentage of a Boeing 787 is made of aluminium?

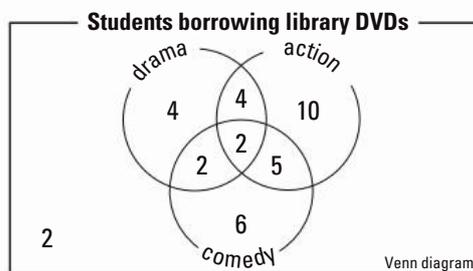
- A) 15%
- B) 20%
- C) 30%
- D) 40%



B

30. [Probability]

What is the probability that a student chosen at random borrows an action DVD? [Give your answer as a fraction in simplest form.]



$\frac{3}{5}$

31. [Problem Solving 1]

What is the smallest positive integer, other than 2, which when divided by 4 or 9 leaves a remainder of 2?

38

32. [Problem Solving 2]

A fence, 3 sections long, requires 4 posts and 6 rails, as shown. How many posts and rails are required to build a fence 17 sections long?



posts = 18 rails = 34

33. [Problem Solving 3]

A 3rd grade maths test included this rather tough challenge. Can you solve it?

If $2 * 6 = 4$ All 3 parts add to 12
 $4 * 1 = 7$ or $a * b = 12 - (a + b)$
 $3 * 4 = 5$
 and $8 * 3 = 1$ find the value of
 $5 * 2 = ?$

5



Name:

1. [+ Whole Numbers to 10]

	11	3	15	10	-26	7	19	-8	22	24
+ 4	15	7	19	14	-22	11	23	-4	26	28

2. [- Whole Numbers to 10]

	27	4	10	22	-16	9	28	31	23	-15
- 8	19	-4	2	14	-24	1	20	23	15	-23

3. [× Whole Numbers to 12]

	11	4	7	10	12	9	-5	8	3	-6
× 9	99	36	63	90	108	81	-45	72	27	-54

4. [+ Whole Numbers to 12]

	20	24	32	-12	40	36	48	28	16	44
÷ 4	5	6	8	-3	10	9	12	7	4	11

5. [Large Number +, -]

$$5914 + 3387 + 236 =$$

9537

6. [Large Number ×, ÷]

$$637 \times 140 =$$

89 180

7. [Decimal +, -]

$$2.58 + 0.7 + 62.4 =$$

65.68

8. [Decimal ×, ÷]

$$0.4 \times 0.06 =$$

0.024

9. [Fraction +, -]

$$\frac{5}{8} - \frac{1}{3} =$$

$\frac{7}{24}$

10. [Fraction ×, ÷]

$$\frac{2}{3} \div \frac{5}{9} =$$

$1\frac{1}{5}$

11. [Percentages]

At the 2016 Rio Olympics, 2 of the 10 medals won by South Africa were gold. What percentage is this?

20%

12. [Decimals / Fractions / Percents]

Complete the table:

Decimal	Fraction	Percent
0.46	$\frac{23}{50}$	46%

13. [Integers]

$$8 \times (-4) =$$

-32

14. [Rates / Ratios]

Stainless steel is 90% iron and 10% chrome. Find the ratio of iron to chrome.

9:1

15. [Indices / Square Roots]

Between which two consecutive whole numbers does $\sqrt{30}$ lie?

5 and 6

16. [Order of Operations]

$$-4 - 10 + 2^3 \times 3 =$$

10

17. [Exploring Numbers]

Choose the integers from this list:

$$\frac{8}{2}, \frac{5}{15}, -16, 0, -2.4$$

$\frac{8}{2}, -16, 0$

18. [Multiples / Factors / Primes]

Express 54 as a product of its prime factors using index notation.

$$54 = 2 \times 3^3$$

19. [Number Patterns]

Find the 15th term in the pattern:

$$2, 4, 6, 8, 10, \dots$$

30

20. [Expressions]

Simplify $2d - d + 3e + e$

$$d + 4e$$

21. [Substitution]

If $n = 4$, find the value of $3(n - 1)$

9

22. [Equations]

Solve for w :

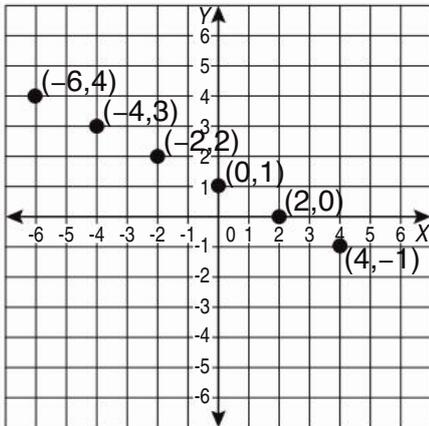
$$4w = -12$$

$$w = -3$$

23. [Coordinates]

Using the table of values, plot the points on the Cartesian plane.

x	-6	-4	-2	0	2	4
y	4	3	2	1	0	-1



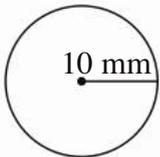
24. [Units of Measurement / Time]

The school concert starts at 4:15 pm and ends at 7:00 pm. How long is the concert in hours and minutes?

2 h 45 min

25. [Perimeter]

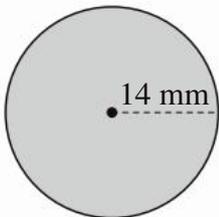
Using $C = 2\pi r$ where $\pi \approx 3.14$, calculate the circumference of the circle.



62.8 mm

26. [Area / Volume]

Using $A = \pi r^2$ and $\pi \approx \frac{22}{7}$, find the area of the circle.



616 mm²

27. [Shapes]

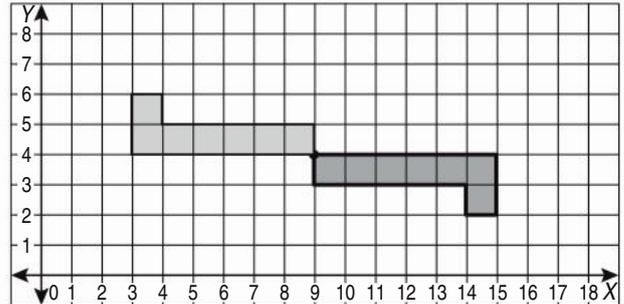
Find the value of x° .



115°

28. [Location / Transformation]

Redraw this shape after rotating it 180° about the point of coordinates (9,4).



29. [Statistics]

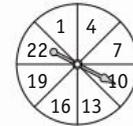
Find the median and range of the average monthly maximum temperatures for Sydney.

Stem	Leaf	Key
1	7 8 8	2 8 = 28°C
2	0 1 2 3 3 5 5 6 6	

median = 22.5 range = 9

30. [Probability]

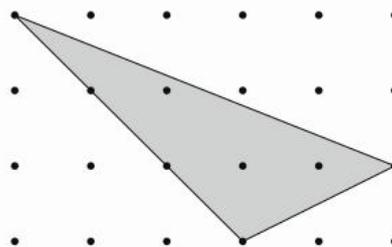
When the spinner is spun once, what is the probability of spinning a number that is not a multiple of 4? [Give your answer as a fraction in simplest form.]



$\frac{3}{4}$

31. [Problem Solving 1]

What is the area of the triangle in square centimetres?



Area = 1 cm²

$4\frac{1}{2}$ cm²

32. [Problem Solving 2]

In how many ways can 15 one-dollar coins be shared between Felix, Anna and Jodie, if each of them receives at least 4 coins?

10

33. [Problem Solving 3]

Each letter stands for a different digit. If WAIT = 8472, what number does STOP represent?

$$\begin{array}{r} \text{G O} \\ + \text{S L O W} \\ \hline \text{S T O P} \end{array}$$

6253



Test 7

Covering worksheets

4.1 - 4.4

Name:

1. [+ Whole Numbers to 10]

	15	-14	7	22	6	19	-13	11	20	8
+ 6	21	-8	13	28	12	25	-7	17	26	14

2. [- Whole Numbers to 10]

	25	-14	30	7	32	1	18	29	23	16
- 7	18	-21	23	0	25	-6	11	22	16	9

3. [× Whole Numbers to 12]

	11	8	-4	10	3	12	7	-6	5	9
× 12	132	96	-48	120	36	144	84	-72	60	108

4. [÷ Whole Numbers to 12]

	27	81	63	108	45	36	90	54	99	-72
÷ 9	3	9	7	12	5	4	10	6	11	-8

5. [Large Number +, -]

$$4873 + 3207 + 845 =$$

8925

6. [Large Number ×, ÷]

$$524 \times 230 =$$

120520

7. [Decimal +, -]

$$0.42 + 83.19 + 2.4 =$$

86.01

8. [Decimal ×, ÷]

$$0.5 \times 0.07 =$$

0.035

9. [Fraction +, -]

$$\frac{1}{3} - \frac{1}{10} =$$

$\frac{7}{30}$

10. [Fraction ×, ÷]

$$\frac{7}{8} \div \frac{3}{4} =$$

$1\frac{1}{6}$

11. [Percentages]

At the 2016 Rio Olympics, 2 of the 8 medals won by Serbia were bronze. What percentage is this?

25%

12. [Decimals / Fractions / Percents]

Complete the table:

Decimal	Fraction	Percent
0.62	$\frac{31}{50}$	62%

13. [Integers]

$$3 \times (-7) =$$

-21

14. [Rates / Ratios]

A male horse has 40 teeth and a female horse has 36 teeth. Find the ratio of the number of teeth in male to female horses.

10:9

15. [Indices / Square Roots]

Between which two consecutive whole numbers does $\sqrt{40}$ lie?

6 and 7

16. [Order of Operations]

$$3 + 14 \div 7 - 2^3 =$$

-3

17. [Exploring Numbers]

Choose the integers from this list:

$$-\frac{2}{3}, \frac{9}{3}, 0.04, -48, 2009$$

$\frac{9}{3}, -48, 2009$

18. [Multiples / Factors / Primes]

Express 36 as a product of its prime factors using index notation.

$$36 = 2^2 \times 3^2$$

19. [Number Patterns]

Find the 20th term in the pattern:

$$1, 3, 5, 7, 9, \dots$$

39

20. [Expressions]

Simplify $3z - a + z + 2a$

$4z + a$

21. [Substitution]

If $u = 3$, find the value of $6(u + 7)$

60

22. [Equations]

Solve for z :

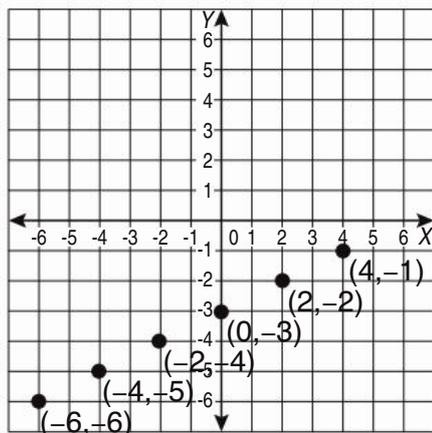
$$4z = -20$$

$z = -5$

23. [Coordinates]

Using the table of values, plot the points on the Cartesian plane.

x	-6	-4	-2	0	2	4
y	-6	-5	-4	-3	-2	-1



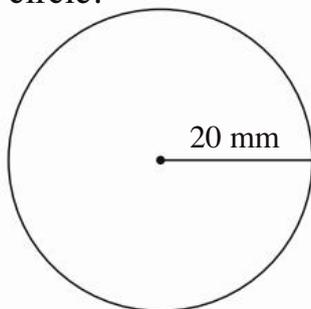
24. [Units of Measurement / Time]

Mum started cooking at 8:40 am and finished at 10:05 am. How long did she cook in hours and minutes?

1 h 25 min

25. [Perimeter]

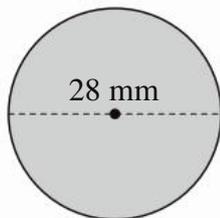
Using $C = 2\pi r$ where $\pi \approx 3.14$, calculate the circumference of the circle.



125.6 mm

26. [Area / Volume]

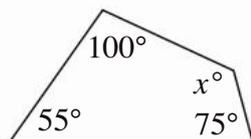
Using $A = \pi r^2$ and $\pi \approx \frac{22}{7}$, find the area of the circle.



616 mm²

27. [Shapes]

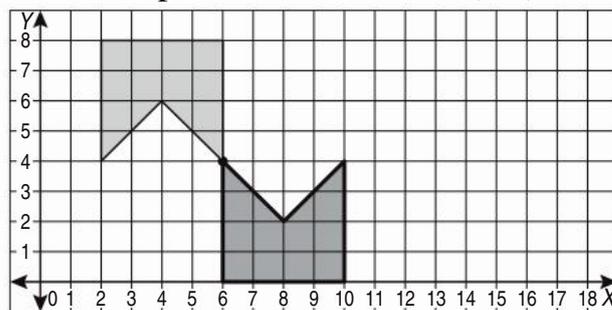
Find the value of x° .



130°

28. [Location / Transformation]

Redraw this shape after rotating it 180° about the point of coordinates (6,4).



29. [Statistics]

Find the median and range of the average monthly maximum temperatures for Melbourne.

Stem	Leaf
1	3 4 4 6 7 9
2	0 1 3 4 5 5

Key
2 | 8 = 28°C

median = 19.5 range = 12

30. [Probability]

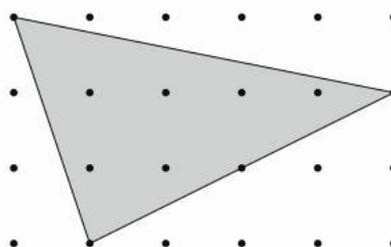
When the spinner is spun once, what is the probability of stopping on a section that is not red (R)? [Give your answer as a fraction.]



$\frac{5}{6}$

31. [Problem Solving 1]

What is the area of the triangle in square centimetres?



Area = 1 cm²

7 cm²

32. [Problem Solving 2]

In how many ways can 14 one-dollar coins be shared between Vince, Stella and Alvis, if each of them receives at least 4 coins?

6

33. [Problem Solving 3]

Each letter stands for a different digit from 1 to 9. If TWO = 428, what number does RIGHT represent?

W	R	O	N	G	
+	W	R	O	N	G
<hr/>					
R	I	G	H	T	

51734



Name:

1. [+ Whole Numbers to 10]

	-3	-16	8	22	19	1	14	15	7	-10
+ 9	6	-7	17	31	28	10	23	24	16	-1

2. [- Whole Numbers to 10]

	3	24	17	-10	25	12	-26	9	-18	21
- 5	-2	19	12	-15	20	7	-31	4	-23	16

3. [× Whole Numbers to 12]

	-9	4	8	11	3	6	5	-12	7	10
× 8	-72	32	64	88	24	48	40	-96	56	80

4. [÷ Whole Numbers to 12]

	60	-54	24	-36	48	72	42	30	66	18
÷ 6	10	-9	4	-6	8	12	7	5	11	3

5. [Large Number +,-]

$$264 + 9578 - 666 =$$

9176

12. [Decimals / Fractions / Percents]

Which is greater?

$$\frac{3}{5} \text{ or } 64\%$$

64%

18. [Multiples / Factors / Primes]

What is the smallest positive integer that has exactly six factors?

12

6. [Large Number ×,÷]

$$3130 \div 4 =$$

782.5

13. [Integers]

$$-27 \div 9 =$$

-3

19. [Number Patterns]

If the general rule of a pattern is $6n + 3$ find the 11th term ($n = 11$).

69

7. [Decimal +,-]

$$7 - 1.92 =$$

5.08

14. [Rates / Ratios]

The average heart beat rate for persons 1 to 3 years old is 130 beats per minute at rest. At this rate how many times is the heart beating in one hour?

7800

20. [Expressions]

Simplify

$$3v + 4w - 2w + 2v$$

$5v + 2w$

9. [Fraction +,-]

$$4\frac{1}{8} - 1\frac{7}{8} =$$

$2\frac{1}{4}$

15. [Indices / Square Roots]

$$(-11)^2 =$$

121

10. [Fraction ×,÷]

$$\frac{5}{8} \times \frac{2}{5} =$$

$\frac{1}{4}$

16. [Order of Operations]

$$10 - 2^3 \div \sqrt{4} =$$

6

21. [Substitution]

If $h = 8$ and $i = 4$, find the value of $3h - i^2$

8

11. [Percentages]

Carla purchased a lounge suite for \$2400. If she later sold it for \$1800, find the loss as a percentage of the cost price.

25%

17. [Exploring Numbers]

Which is **not** a rational number?

- A) 0 B) $-\frac{3}{7}$
C) π D) 8.24

C

22. [Equations]

Solve for y:

$$4y - 3 = -23$$

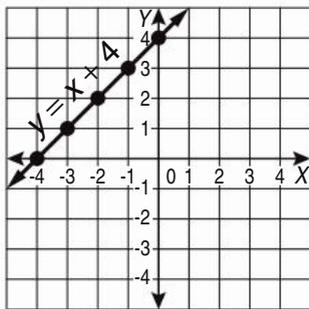
$y = -5$

23. [Coordinates]

Graph the line of equation $y = x + 4$ by first completing this table of values.

[Label the line with the equation.]

x	-4	-3	-2	-1	0
y	0	1	2	3	4
(x,y)	(-4,0)	(-3, 1)	(-2, 2)	(-1, 3)	(0, 4)



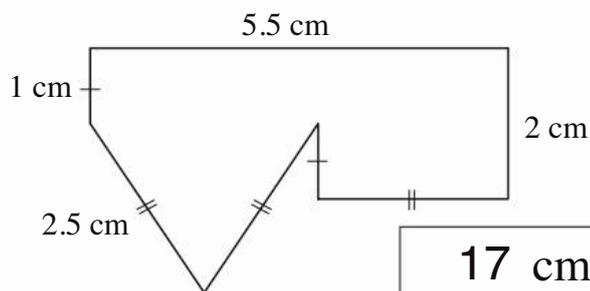
24. [Units of Measurement / Time]

It is 4:30 pm in Perth. If Perth time is 2 hours behind Melbourne time, what time is it in Melbourne?

6:30 pm

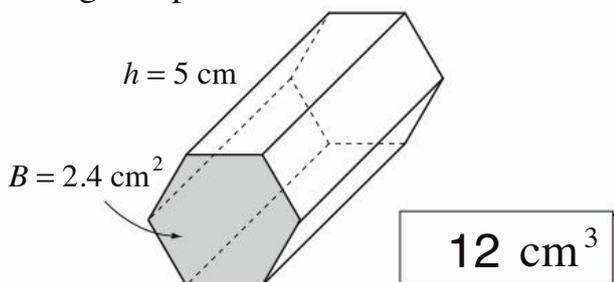
25. [Perimeter]

Calculate the perimeter of the polygon.



26. [Area / Volume]

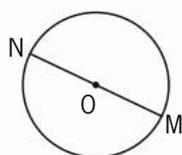
Using $V = Bh$ find the volume of the hexagonal prism.



27. [Shapes]

What is \overline{OM} in this diagram?

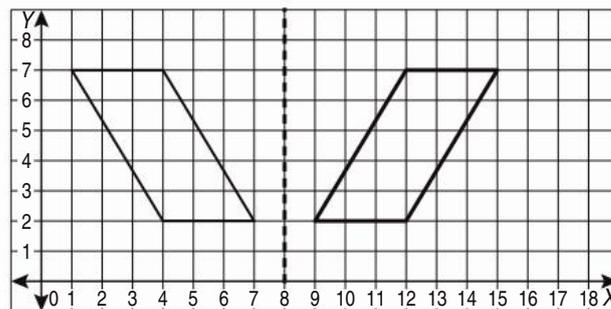
- A) radius
- B) circumference
- C) diameter
- D) tangent



A

28. [Location / Transformation]

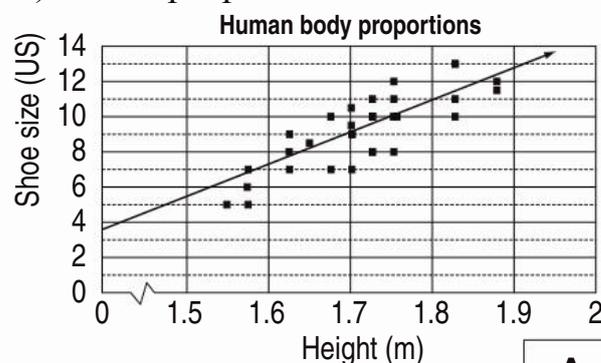
Redraw this parallelogram after reflecting it in the line of equation $x = 8$



29. [Statistics]

Which describes the relationship?

- A) Taller people have bigger feet
- B) Shorter people have bigger feet
- C) Taller people have smaller shoes



A

30. [Probability]

How many possible outfits can be created with 6 different shirts, 4 different skirts and 2 different pairs of shoes?

48

31. [Problem Solving 1]

The fraction of boys in our school band has risen from $\frac{2}{5}$ to $\frac{1}{2}$ with the arrival of the Harper twin boys. How many band members are there now?

12

32. [Problem Solving 2]

Four consecutive whole numbers are added. If the smallest number is $n + 3$, what is the sum of the four numbers?

$4n + 18$

33. [Problem Solving 3]

If n is an integer, which of the following must be an even integer?

- A) n^3
- B) $2n - 1$
- C) $2n^2 + 2$
- D) $n + 10$

C



Name:

1. [+ Whole Numbers to 10]

	4	17	23	9	11	-15	12	8	10	-16
+ 8	12	25	31	17	19	-7	20	16	18	-8

2. [- Whole Numbers to 10]

	13	-7	14	12	-15	10	6	11	19	18
- 6	7	-13	8	6	-21	4	0	5	13	12

3. [× Whole Numbers to 12]

	12	6	-11	5	8	7	3	9	-4	10
× 5	60	30	-55	25	40	35	15	45	-20	50

4. [÷ Whole Numbers to 12]

	120	60	72	132	96	-36	-84	144	108	48
÷ 12	10	5	6	11	8	-3	-7	12	9	4

5. [Large Number +, -]

$$382 + 8752 - 555 =$$

8579

12. [Decimals / Fractions / Percents]

Which is greater?

$$\frac{2}{5} \text{ or } 42\%$$

42%

18. [Multiples / Factors / Primes]

What is the smallest positive integer that has exactly five factors?

16

6. [Large Number ×, ÷]

$$3064 \div 5 =$$

612.8

13. [Integers]

$$-20 \div 5 =$$

-4

7. [Decimal +, -]

$$9 - 6.74 =$$

2.26

14. [Rates / Ratios]

The average resting heart beat for people over 16 years of age is 70 beats per minute. At this rate how many times is the heart beating in one and a half hours?

19. [Number Patterns]

If the general rule of a pattern is $3n + 5$ find the 12th term ($n = 12$).

41

8. [Decimal ×, ÷]

$$3 \div 0.2 =$$

15

9. [Fraction +, -]

$$3\frac{3}{10} - 1\frac{9}{10} =$$

1 $\frac{2}{5}$

6300

15. [Indices / Square Roots]

$$(-9)^2 =$$

81

20. [Expressions]

Simplify $5d + 2c + d - c$

6d + c

10. [Fraction ×, ÷]

$$\frac{5}{9} \times \frac{9}{10} =$$

1/2

16. [Order of Operations]

$$12 - 3^3 \div \sqrt{9} =$$

3

21. [Substitution]

If $m = 9$ and $n = 5$, find the value of $4m - n^2$

11

11. [Percentages]

A shop buys shirts in bulk for \$25 each and then sells them for \$45 each. Calculate the profit on each shirt as a percentage of the cost price.

80%

17. [Exploring Numbers]

Which is **not** a rational number?

A) -0.5 B) $-\sqrt{8}$

C) 69 D) 1

22. [Equations]

Solve for g:

$$2g - 6 = -18$$

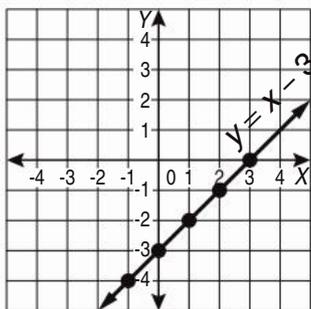
g = -6

23. [Coordinates]

Graph the line of equation $y = x - 3$ by first completing this table of values.

[Label the line with the equation.]

x	-1	0	1	2	3
y	-4	-3	-2	-1	0
(x,y)	(-1,-4)	(0,-3)	(1,-2)	(2,-1)	(3,0)



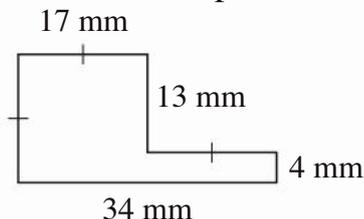
24. [Units of Measurement / Time]

It is 12:00 pm in Brisbane. If Auckland time is 3 hours ahead of Brisbane time, what time is it in Auckland?

3:00 pm

25. [Perimeter]

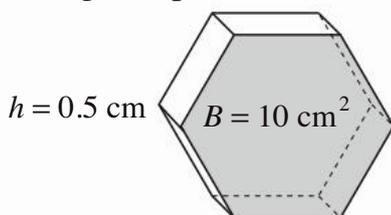
Calculate the perimeter of the polygon.



102 mm

26. [Area / Volume]

Using $V = Bh$ find the volume of the hexagonal prism.

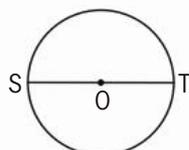


5 cm³

27. [Shapes]

What is \overline{ST} in this diagram?

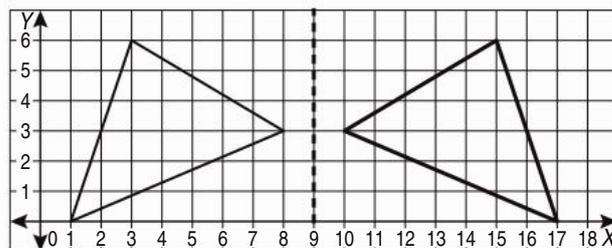
- A) radius
- B) circumference
- C) diameter
- D) tangent



C

28. [Location / Transformation]

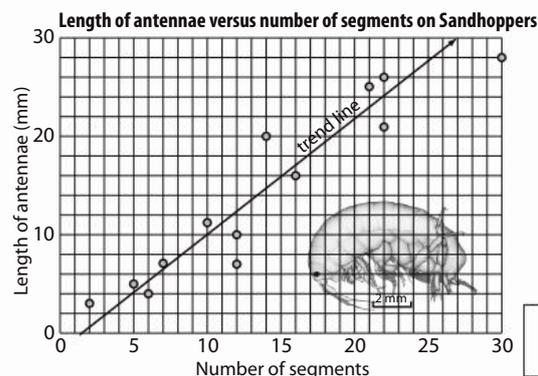
Redraw this triangle after reflecting it in the line of equation $x = 9$



29. [Statistics]

Which best describes the relationship?

- A) More segments, shorter antennae
- B) Less segments, longer antennae
- C) More segments, longer antennae



C

30. [Probability]

Chu has 5 rock, 4 hip hop and 6 rap songs on his CD. How many combinations are possible if Chu randomly selects 1 from each song style?

120

31. [Problem Solving 1]

The school board would like to raise the fraction of fathers on the board from $\frac{1}{3}$ to $\frac{1}{2}$. This could be done by replacing just two mothers with fathers. How many parents are on the school board?

12

32. [Problem Solving 2]

Four consecutive whole numbers are added. If the smallest number is $n + 1$, what is the sum of the four numbers?

4n + 10

33. [Problem Solving 3]

If n is an integer, which of the following must be an odd integer?

- A) $3n + 3$
- B) $2n - 3$
- C) $n^2 + 1$
- D) $n + 5$

B

MATHS MATE



Teacher Resource



Teacher's Guide to the Use of Maths Mate

pages i - viii



Student Workbook Answers

pages 3 - 72



Student Workbook Short Answers

pages 1 - 8



Problem Solving Hints & Solutions

pages 1 - 20



Test Masters

pages 1 - 32



Test Answers

pages 1 - 32



Record Keeping Sheets

pages 1 - 10

MATHS MATE



Name:

Class:

Teacher:

Worksheet Results

Term 1

	Sheet 1	Sheet 2	Sheet 3	Sheet 4	Skill Builder links	Sheet 5	Sheet 6	Sheet 7	Sheet 8	Skill Builder links										
NUMBER	1. [+ Whole Numbers to 10]	1	1	1	1	1.1	1	1	1	1	1.1									
	2. [- Whole Numbers to 10]	2	2	2	2	2.1	2	2	2	2	2.1									
	3. [\times Whole Numbers to 12]	3	3	3	3	3.1	3	3	3	3	3.1									
	4. [\div Whole Numbers to 12]	4	4	4	4	4.1	4	4	4	4	4.1									
	5. [Large Number +,-]	5	5	5	5	5.4	5	5	5	5	5.3									
	6. [Large Number \times,\div]	6	6	6	6	6.2	6	6	6	6	6.1,5									
	7. [Decimal +,-]	7	7	7	7	7.1	7	7	7	7	7.2									
	8. [Decimal \times,\div]	8	8	8	8	8.3	8	8	8	8	8.1									
	9. [Fraction +,-]	9	9	9	9	9.1,2	9	9	9	9	9.3,4									
	10. [Fraction \times,\div]	10	10	10	10	10.1	10	10	10	10	10.2									
	11. [Percentages]	11	11	11	11	11.2	11	11	11	11	11.3									
	12. [Decimals / Fractions / Percentages]	12	12	12	12	12.4	12	12	12	12	12.2									
	13. [Integers]	13	13	13	13	13.1,2	13	13	13	13	13.3,4									
	14. [Rates / Ratios]	14	14	14	14	14.1,2	14	14	14	14	14.3									
	15. [Indices / Square Roots]	15	15	15	15	15.2	15	15	15	15	15.3									
	16. [Order of Operations]	16	16	16	16	16.2	16	16	16	16	16.4									
	17. [Exploring Numbers]	17	17	17	17	17.2	17	17	17	17	17.2									
	18. [Multiples / Factors / Primes]	18	18	18	18	18.2,3	18	18	18	18	18.4									
	19. [Number Patterns]	19	19	19	19	19.1,2,3	19	19	19	19	19.5									
ALGEBRA	20. [Expressions]	20	20	20	20	20.1	20	20	20	20	20.2									
	21. [Substitution]	21	21	21	21	21.3	21	21	21	21	21.4									
	22. [Equations]	22	22	22	22	22.1	22	22	22	22	22.2									
	23. [Coordinates]	23	23	23	23	23.2,3,5	23	23	23	23	23.4									
MEASUREMENT	24. [Units of Measurement / Time]	24	24	24	24	24.2	24	24	24	24	24.3									
	25. [Perimeter]	25	25	25	25	25.1,2	25	25	25	25	25.3									
	26. [Area / Volume]	26	26	26	26	26.2,3	26	26	26	26	26.4									
SPACE	27. [Shapes]	27	27	27	27	27.1,2	27	27	27	27	27.3,4									
	28. [Location / Transformation]	28	28	28	28	28.2	28	28	28	28	28.3									
STAT.	29. [Statistics]	29	29	29	29	29.3	29	29	29	29	29.4									
PROB.	30. [Probability]	30	30	30	30	30.3	30	30	30	30	30.4									
PROBLEM SOLVING	31. [Problem Solving 1]	31	31	31	31	Hints & Solutions	31	31	31	31	Hints & Solutions									
	32. [Problem Solving 2]	32	32	32	32	Hints & Solutions	32	32	32	32	Hints & Solutions									
	33. [Problem Solving 3]	33	33	33	33	Hints & Solutions	33	33	33	33	Hints & Solutions									
Total Correct											<input type="text"/>									

MATHS MATE



Name:

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Worksheet Results

Term 2

	Sheet 1	Sheet 2	Sheet 3	Sheet 4	Skill Builder links	Sheet 5	Sheet 6	Sheet 7	Sheet 8	Skill Builder links
NUMBER	1	1	1	1	1.1	1	1	1	1	1.1
	2	2	2	2	2.1	2	2	2	2	2.1
	3	3	3	3	3.1	3	3	3	3	3.1
	4	4	4	4	4.1	4	4	4	4	4.1
	5	5	5	5	5.4	5	5	5	5	5.3
	6	6	6	6	6.4	6	6	6	6	6.3
	7	7	7	7	7.1	7	7	7	7	7.2
	8	8	8	8	8.2,4	8	8	8	8	8.5
	9	9	9	9	9.5	9	9	9	9	9.1,2
	10	10	10	10	10.3	10	10	10	10	10.4
	11	11	11	11	11.4	11	11	11	11	11.5
	12	12	12	12	12.5	12	12	12	12	12.6,7
	13	13	13	13	13.5,6	13	13	13	13	13.6
	14	14	14	14	14.3	14	14	14	14	14.4
	15	15	15	15	15.4	15	15	15	15	15.2
	16	16	16	16	16.4	16	16	16	16	16.4
	17	17	17	17	17.3,4	17	17	17	17	17.5
	18	18	18	18	18.5,6	18	18	18	18	18.7
	19	19	19	19	19.6,7	19	19	19	19	19.8
ALGEBRA	20	20	20	20	20.3	20	20	20	20	20.4
	21	21	21	21	21.5,6	21	21	21	21	21.7
	22	22	22	22	22.3	22	22	22	22	22.4
	23	23	23	23	23.5	23	23	23	23	23.6
MEASUREMENT	24	24	24	24	24.2	24	24	24	24	24.4
	25	25	25	25	25.4	25	25	25	25	25.2
	26	26	26	26	26.5	26	26	26	26	26.6,7
SPACE	27	27	27	27	27.7	27	27	27	27	27.8
	28	28	28	28	28.4	28	28	28	28	28.5
STAT.	29	29	29	29	29.5	29	29	29	29	29.6,7
PROB.	30	30	30	30	30.5	30	30	30	30	30.5
PROBLEM SOLVING	31	31	31	31	Hints & Solutions	31	31	31	31	Hints & Solutions
	32	32	32	32	Hints & Solutions	32	32	32	32	Hints & Solutions
	33	33	33	33	Hints & Solutions	33	33	33	33	Hints & Solutions
Total Correct										

MATHS MATE



Name:

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Worksheet Results

Term 3

	Sheet 1	Sheet 2	Sheet 3	Sheet 4	Skill Builder links	Sheet 5	Sheet 6	Sheet 7	Sheet 8	Skill Builder links										
NUMBER	1. [+ Whole Numbers to 10]	1	1	1	1	1.1,2	1	1	1	1	1.1,2									
	2. [- Whole Numbers to 10]	2	2	2	2	2.1,2	2	2	2	2	2.1,2									
	3. [× Whole Numbers to 12]	3	3	3	3	3.1	3	3	3	3	3.1									
	4. [÷ Whole Numbers to 12]	4	4	4	4	4.1	4	4	4	4	4.1									
	5. [Large Number +,-]	5	5	5	5	5.4	5	5	5	5	5.3									
	6. [Large Number ×,÷]	6	6	6	6	6.7	6	6	6	6	6.6,8									
	7. [Decimal +,-]	7	7	7	7	7.1	7	7	7	7	7.2									
	8. [Decimal ×,÷]	8	8	8	8	8.6	8	8	8	8	8.5									
	9. [Fraction +,-]	9	9	9	9	9.3	9	9	9	9	9.6,8									
	10. [Fraction ×,÷]	10	10	10	10	10.5	10	10	10	10	10.4									
	11. [Percentages]	11	11	11	11	11.5	11	11	11	11	11.4,6									
	12. [Decimals / Fractions / Percentages]	12	12	12	12	12.8,9	12	12	12	12	12.10,11									
	13. [Integers]	13	13	13	13	13.7	13	13	13	13	13.8									
	14. [Rates / Ratios]	14	14	14	14	14.5,6	14	14	14	14	14.7									
	15. [Indices / Square Roots]	15	15	15	15	15.4	15	15	15	15	15.5									
	16. [Order of Operations]	16	16	16	16	16.5	16	16	16	16	16.5									
	17. [Exploring Numbers]	17	17	17	17	17.6,7	17	17	17	17	17.8									
	18. [Multiples / Factors / Primes]	18	18	18	18	18.8	18	18	18	18	18.9									
	19. [Number Patterns]	19	19	19	19	19.8	19	19	19	19	19.9									
ALGEBRA	20. [Expressions]	20	20	20	20	20.3	20	20	20	20	20.5									
	21. [Substitution]	21	21	21	21	21.8	21	21	21	21	21.9									
	22. [Equations]	22	22	22	22	22.5	22	22	22	22	22.6									
	23. [Coordinates]	23	23	23	23	23.7	23	23	23	23	23.8									
MEASUREMENT	24. [Units of Measurement / Time]	24	24	24	24	24.1	24	24	24	24	24.5									
	25. [Perimeter]	25	25	25	25	25.5	25	25	25	25	25.6									
	26. [Area / Volume]	26	26	26	26	26.8	26	26	26	26	26.9									
SPACE	27. [Shapes]	27	27	27	27	27.9	27	27	27	27	27.10,11									
	28. [Location / Transformation]	28	28	28	28	28.5	28	28	28	28	28.6									
STAT.	29. [Statistics]	29	29	29	29	29.8	29	29	29	29	29.9									
PROB.	30. [Probability]	30	30	30	30	30.5,6	30	30	30	30	30.7									
PROBLEM SOLVING	31. [Problem Solving 1]	31	31	31	31	Hints & Solutions	31	31	31	31	Hints & Solutions									
	32. [Problem Solving 2]	32	32	32	32	Hints & Solutions	32	32	32	32	Hints & Solutions									
	33. [Problem Solving 3]	33	33	33	33	Hints & Solutions	33	33	33	33	Hints & Solutions									
Total Correct											<input type="text"/>									

MATHS MATE



Name:

Class:

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Worksheet Results

Term 4

	Sheet 1	Sheet 2	Sheet 3	Sheet 4	Skill Builder links	Sheet 5	Sheet 6	Sheet 7	Sheet 8	Skill Builder links
NUMBER	1	1	1	1	1.1,2	1	1	1	1	1.1,2
	2	2	2	2	2.1,2	2	2	2	2	2.1,2
	3	3	3	3	3.1,2	3	3	3	3	3.1,2
	4	4	4	4	4.1,2	4	4	4	4	4.1,2
	5	5	5	5	5.5	5	5	5	5	5.5
	6	6	6	6	6.9	6	6	6	6	6.10
	7	7	7	7	7.1	7	7	7	7	7.3
	8	8	8	8	8.5	8	8	8	8	8.7
	9	9	9	9	9.7,9	9	9	9	9	9.4
	10	10	10	10	10.6	10	10	10	10	10.4
	11	11	11	11	11.7	11	11	11	11	11.8
	12	12	12	12	12.12	12	12	12	12	12.13
	13	13	13	13	13.9	13	13	13	13	13.10
	14	14	14	14	14.8	14	14	14	14	14.9
	15	15	15	15	15.6	15	15	15	15	15.7
	16	16	16	16	16.6	16	16	16	16	16.7
	17	17	17	17	17.9	17	17	17	17	17.10
	18	18	18	18	18.10	18	18	18	18	18.4
	19	19	19	19	19.10	19	19	19	19	19.11
ALGEBRA	20	20	20	20	20.5	20	20	20	20	20.5
	21	21	21	21	21.10	21	21	21	21	21.11
	22	22	22	22	22.7	22	22	22	22	22.8
	23	23	23	23	23.9	23	23	23	23	23.10
MEASUREMENT	24	24	24	24	24.6	24	24	24	24	24.7
	25	25	25	25	25.7	25	25	25	25	25.8
	26	26	26	26	26.10	26	26	26	26	26.11
SPACE	27	27	27	27	27.10,11,12	27	27	27	27	27.13
	28	28	28	28	28.7	28	28	28	28	28.8,9
STAT.	29	29	29	29	29.10	29	29	29	29	29.11
PROB.	30	30	30	30	30.8,9	30	30	30	30	30.10
PROBLEM SOLVING	31	31	31	31	Hints & Solutions	31	31	31	31	Hints & Solutions
	32	32	32	32	Hints & Solutions	32	32	32	32	Hints & Solutions
	33	33	33	33	Hints & Solutions	33	33	33	33	Hints & Solutions
Total Correct										

MATHS MATE



Name:

Class:

Teacher:

Test Results

		Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Test 7	Test 8
NUMBER	1. [+ Whole Numbers to 10]	<input type="text"/>							
	2. [- Whole Numbers to 10]	<input type="text"/>							
	3. [× Whole Numbers to 12]	<input type="text"/>							
	4. [÷ Whole Numbers to 12]	<input type="text"/>							
	5. [Large Number +,-]	<input type="text"/>							
	6. [Large Number ×,÷]	<input type="text"/>							
	7. [Decimal +,-]	<input type="text"/>							
	8. [Decimal ×,÷]	<input type="text"/>							
	9. [Fraction +,-]	<input type="text"/>							
	10. [Fraction ×,÷]	<input type="text"/>							
	11. [Percentages]	<input type="text"/>							
	12. [Decimals / Fractions / Percentages]	<input type="text"/>							
	13. [Integers]	<input type="text"/>							
	14. [Rates / Ratios]	<input type="text"/>							
	15. [Indices / Square Roots]	<input type="text"/>							
	16. [Order of Operations]	<input type="text"/>							
	17. [Exploring Numbers]	<input type="text"/>							
	18. [Multiples / Factors / Primes]	<input type="text"/>							
	19. [Number Patterns]	<input type="text"/>							
ALGEBRA	20. [Expressions]	<input type="text"/>							
	21. [Substitution]	<input type="text"/>							
	22. [Equations]	<input type="text"/>							
	23. [Coordinates]	<input type="text"/>							
MEASUREMENT	24. [Units of Measurement / Time]	<input type="text"/>							
	25. [Perimeter]	<input type="text"/>							
	26. [Area / Volume]	<input type="text"/>							
SPACE	27. [Shapes]	<input type="text"/>							
	28. [Location / Transformation]	<input type="text"/>							
STAT.	29. [Statistics]	<input type="text"/>							
PROB.	30. [Probability]	<input type="text"/>							
PROBLEM SOLVING	31. [Problem Solving 1]	<input type="text"/>							
	32. [Problem Solving 2]	<input type="text"/>							
	33. [Problem Solving 3]	<input type="text"/>							
Total Correct		<input type="text"/>							



Class:

Teacher:

Worksheet Number	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8
1								
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34								

✓ - Signed by parent L - Work handed in late x - Not signed by parent



Class:

Teacher:

	Worksheet Number	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8
1									
2									
3									
4									
5									
6									
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✓ - Signed by parent

L - Work handed in late

✗ - Not signed by parent



Class:

Teacher:

Worksheet Number	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8
1								
2								
3								
4								
5								
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34								

✓ - Signed by parent L - Work handed in late x - Not signed by parent



Class:

Teacher:

	Worksheet Number	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8
1									
2									
3									
4									
5									
6									
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34									

✓ - Signed by parent
 L - Work handed in late
 ✗ - Not signed by parent