sixth edition

MATHS MATE

trial pack

Includes:

How to use Maths Mate

Record keeping sheet: Term 1

Worksheet masters: Term 1, Sheets 1 to 4

Test masters: 1A & 1B

Worksheet answers: Term 1, Sheets 1 to 4

Test answers: 1A & 1B

Problem Solving Hints & Solutions

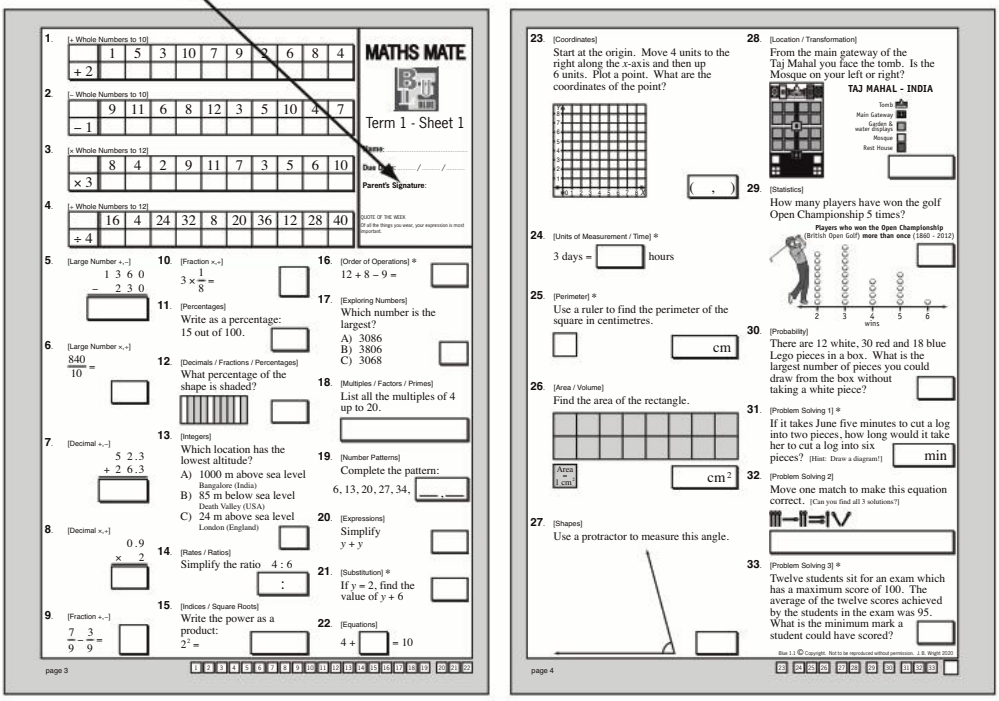
Skill Builders:

10.1 Finding the unit rate and the unit price.
10.2 Simplifying ratios.
20.6 Solving equations involving algebraic fractions.

J. B. Wright & I. Tutos

HOW TO USE MATHS MATE

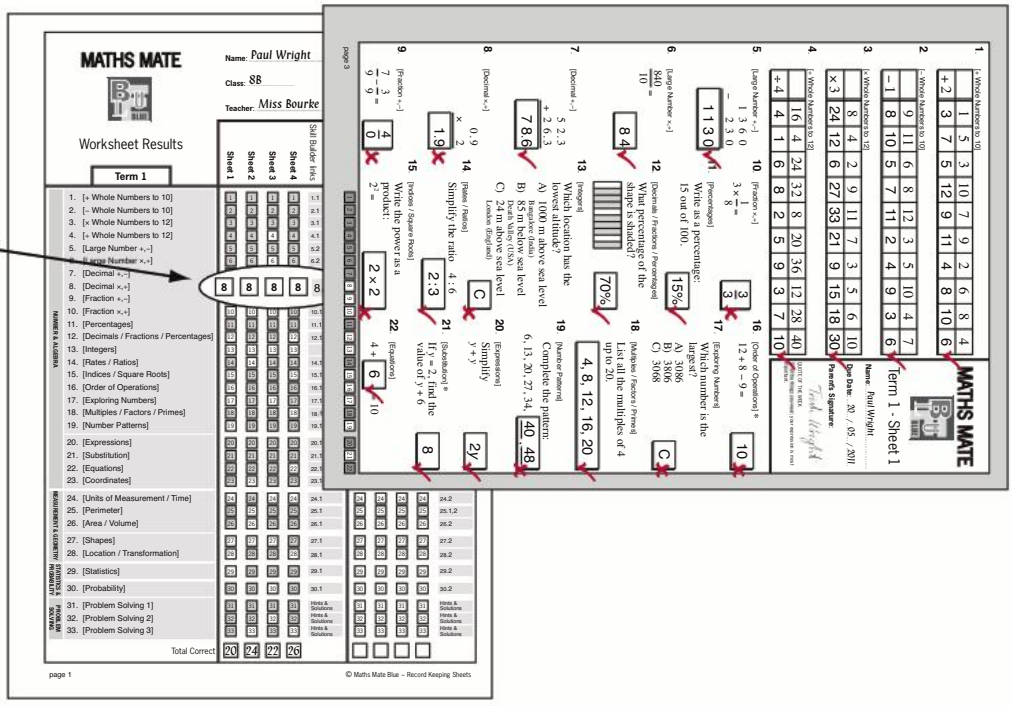
1. Students complete the **Maths Mate sheet.**
Parents sign the work.



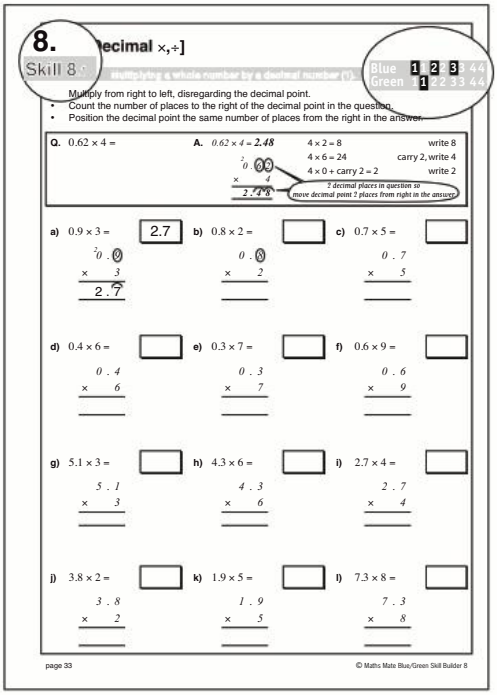
2. Students correct their work in class. Students colour the boxes to record their correct answers.

3. The student **record keeping sheets** are completed. Students can transfer their results directly from the worksheet to the results sheet.

4. Students identify the appropriate Skill Builder as listed on the record keeping sheet.



5. Students complete the **Skill Builder.** Students are supported with instructions and worked examples.



8. Skill 8: [×,÷ decimal]

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.

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

Q. 0.62 × 4 = **A.** 0.62 × 4 = **2.48**

4 × 2 = 8 write 8
4 × 6 = 24 carry 2, write 4
4 × 0 + carry 2 = 2 write 2

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

a) 0.9 × 3 = 2.7 b) 0.8 × 2 = c) 0.7 × 5 =

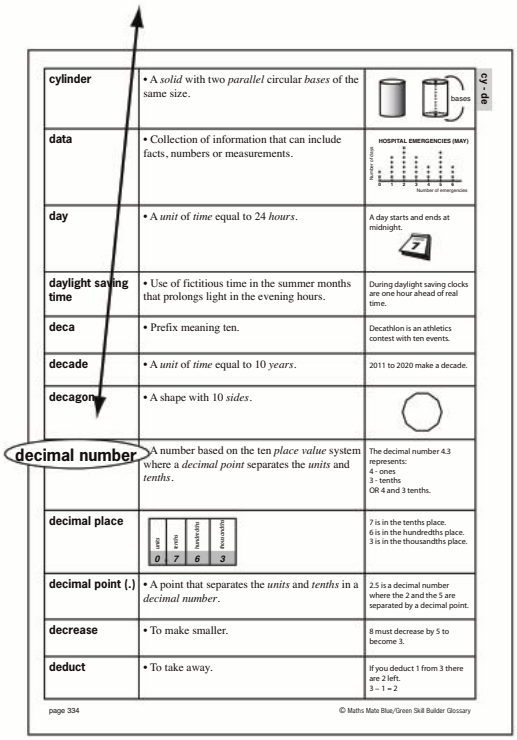
d) 0.4 × 6 = e) 0.3 × 7 = f) 0.6 × 9 =

g) 5.1 × 3 = h) 4.3 × 6 = i) 2.7 × 4 =

j) 3.8 × 2 = k) 1.9 × 5 = l) 7.3 × 8 =

page 33 © Maths Mate Blue/Green Skill Builder 8

6. The Skill Builders also have a **Glossary** and **Maths Facts**.



cylinder	• A *solid* with two *parallel* circular *bases* of the same size.	bases
data	• Collection of information that can include facts, numbers or measurements.	HOSPITAL EMERGENCIES (MAY)
day	• A *unit* of *time* equal to 24 *hours*.	A day starts and ends at midnight.
daylight saving time	• Use of fictitious time in the summer months that prolongs light in the evening hours.	During daylight saving clocks are one hour ahead of real time.
deca	• Prefix meaning ten.	Decathlon is an athletics contest with ten events.
decade	• A *unit* of *time* equal to 10 *years*.	2011 to 2020 make a decade.
decagon	• A shape with 10 *sides*.	
decimal number	• A number based on the ten *place value* system where a *decimal point* separates the *units* and *tenths*.	The decimal number 4.3 represents: 4 - ones 3 - tenths OR 4 and 3 tenths.
decimal place		7 is in the tenths place. 6 is in the hundredths place. 3 is in the thousandths place.
decimal point (.)	• A point that separates the *units* and *tenths* in a *decimal number*.	2.5 is a decimal number where the 2 and the 5 are separated by a decimal point.
decrease	• To make smaller.	8 must decrease by 5 to become 3.
deduct	• To take away.	If you deduct 1 from 3 there are 2 left. 3 – 1 = 2

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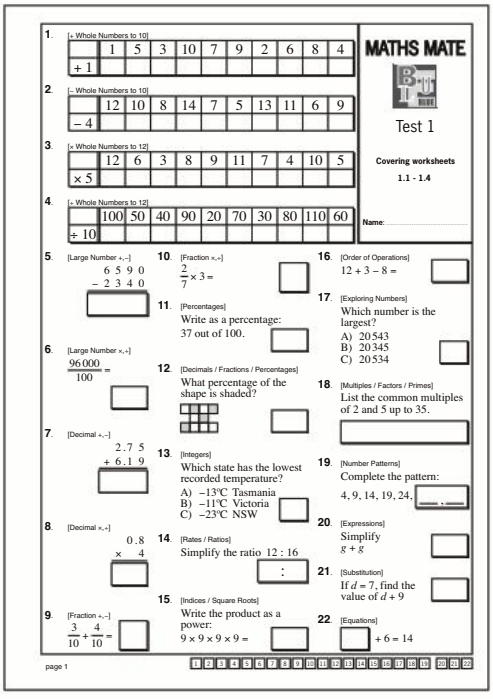
7. **Testing** is available after every 4 Maths Mate sheets.



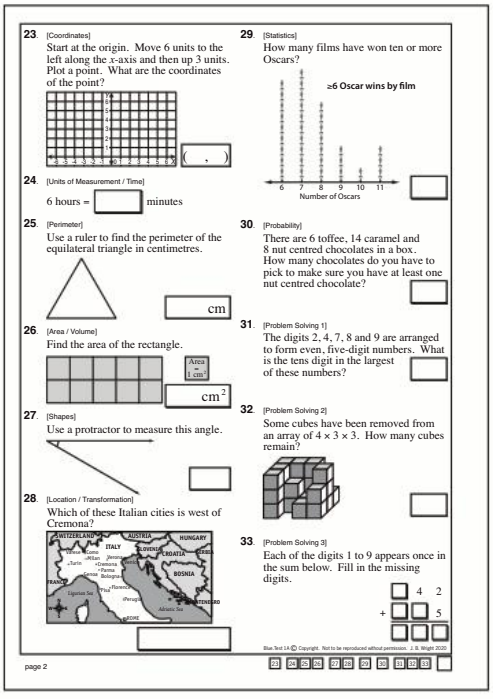
MATHS MATE

Test 1

Covering worksheets 1.1 - 1.4

Name:

page 1



page 2

8. If a student is having difficulty with their problem solving strategies, then the **Problem Solving Hints & Solutions** can be used by teachers to develop students' problem solving skills.

1.3

31. **Hint:** *Consider the properties of even numbers. Make an organised list ordering the digits from largest to smallest.*

Solution: To be even, the numbers must end in 4 or 6. The largest possibilities for each ending are 76 534 and 75 436.

The largest number is 76 534 and the hundreds digit is **5**.

MATHS MATE

Worksheet Results

Term 1

Name: .....

Class: .....

Teacher: .....

		Sheet 1	Sheet 2	Sheet 3	Sheet 4	Skill Builder links	Sheet 5	Sheet 6	Sheet 7	Sheet 8	Skill Builder links
NUMBER	1. [Long ×,÷]	1	1	1	1	1.1	1	1	1	1	1.4,6
	2. [Decimal +,–]	2	2	2	2	2.1	2	2	2	2	2.2
	3. [Decimal ×,÷]	3	3	3	3	3.2	3	3	3	3	3.3
	4. [Fraction +,–]	4	4	4	4	4.1,2	4	4	4	4	4.3,4
	5. [Fraction ×,÷]	5	5	5	5	5.2	5	5	5	5	5.5
	6. [Percentages]	6	6	6	6	6.3,4	6	6	6	6	6.5,9
	7. [Decimals / Fractions / Percentages]	7	7	7	7	7.3	7	7	7	7	7.4,5
	8. [Integer +,–]	8	8	8	8	8.1	8	8	8	8	8.2
	9. [Integer ×,÷]	9	9	9	9	9.1	9	9	9	9	9.2
	10. [Rates / Ratios]	10	10	10	10	10.2,3,4	10	10	10	10	10.5,6,7
	11. [Indices]	11	11	11	11	11.1,2	11	11	11	11	11.3
	12. [Square Roots]	12	12	12	12	12.2	12	12	12	12	12.3
	13. [Exploring Number]	13	13	13	13	13.1,2	13	13	13	13	13.3,4
	14. [Financial Mathematics]	14	14	14	14	14.1,3	14	14	14	14	14.4
	15. [Number Patterns]	15	15	15	15	15.2	15	15	15	15	15.3
ALGEBRA	16. [Expressions]	16	16	16	16	16.1	16	16	16	16	16.2
	17. [Substitution]	17	17	17	17	17.2,3	17	17	17	17	17.4
	18. [Expansion]	18	18	18	18	18.1	18	18	18	18	18.2,3
	19. [Factorisation]	19	19	19	19	19.1	19	19	19	19	19.3
	20. [Equations]	20	20	20	20	20.3	20	20	20	20	20.7
	21. [Coordinate Geometry]	21	21	21	21	21.3,5	21	21	21	21	21.6,7
MEASUREMENT	22. [Units of Measurement / Time]	22	22	22	22	22.3	22	22	22	22	22.4
	23. [Perimeter / Area]	23	23	23	23	23.1,2	23	23	23	23	23.6,8,9
	24. [Surface Area]	24	24	24	24	24.2	24	24	24	24	24.3
	25. [Volume]	25	25	25	25	25.1,2	25	25	25	25	25.2
	26. [Pythagoras / Trigonometry]	26	26	26	26	26.3	26	26	26	26	26.4,5
SPACE	27. [Angles]	27	27	27	27	27.2,3	27	27	27	27	27.4
	28. [Geometric Reasoning]	28	28	28	28	28.5,6,7	28	28	28	28	28.8
STAT.	29. [Statistics]	29	29	29	29	29.5,6,7,8	29	29	29	29	29.3,4,9
PROB.	30. [Probability]	30	30	30	30	30.2	30	30	30	30	30.2
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
	Total Correct	◯	◯	◯	◯		◯	◯	◯	◯	

MATHS MATE

Term 1 - Sheet 1

Name: .....

Due Date: ...../...../.....

Parent's Signature: .....

1. [Long ×,÷]

$902 \times 1000 =$

2. [Decimal +,–] *

$13.87 + 6.9 =$

3. [Decimal ×,÷]

$10 \times 0.064 =$

4. [Fraction +,–] *

$\frac{4}{15} + \frac{1}{15} =$

5. [Fraction ×,÷]

$\frac{2}{5} \times \frac{2}{7} =$

6. [Percentages] *

40% of 600 =

7. [Decimals / Fractions / Percentages] *

Complete the equivalent fractions:

$\frac{3}{5} = \frac{9}{\square} = \frac{\square}{60}$

8. [Integer +,–]

$(-14) + (+11) =$

9. [Integer ×,÷]

$(-7) \times (+11) =$

10. [Rates / Ratios] *

Simplify $\$4 : 50¢ : \$2.50$

11. [Indices] *

$4^4 =$

12. [Square Roots] *

$\sqrt{\frac{25}{64}} =$

13. [Exploring Number] *

$6 + 8 - (11 - 5) =$

14. [Financial Mathematics] *

Charlie paid a $200 deposit for a lay-by on a $2500 computer as the store demanded. What percentage of the sale price does the store expect on lay-by?

15. [Number Patterns]

Complete the pattern:

0 , 2 , 6 , 12 , 20 , ___ , ___

16. [Expressions]

Write as an expression:

3 times the product of m and n

17. [Substitution] *

If $x = 3$, find the value of $5x - 8$

18. [Expansion]

Expand $4(k - 5)$

19. [Factorisation]

Factorise $3r + 9s$

20. [Equations] *

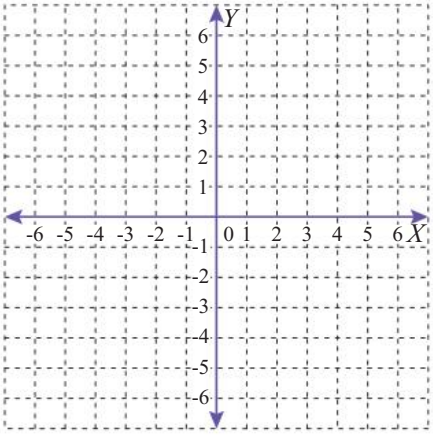
Solve for x: $4x - 3 = 0$

21. [Coordinate Geometry] *

Graph the line of equation $y = 2x$ by first completing this table of values.

[Label the line with the rule.]

x	–2	–1	0	1	2
y	–4				



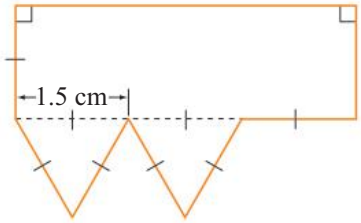
QUOTE OF THE WEEK: A wise man makes his own decisions, an ignorant man follows the public opinion. Chinese Proverb

22. [Units of Measurement / Time]

Which metric prefix is used to describe 1000 standard units?

23. [Perimeter / Area] *

Find the perimeter of the polygon.



cm

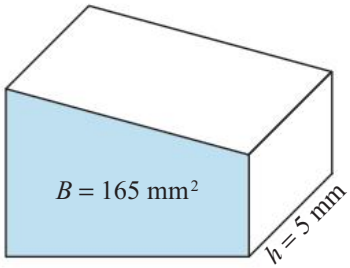
24. [Surface Area] *

Find the total surface area of a detergent box of width 80 mm, length 200 mm and height 150 mm.

mm^2

25. [Volume] *

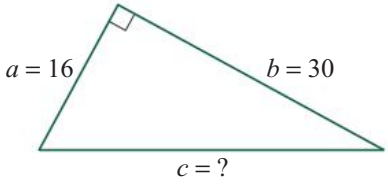
Using $V = Bh$ find the volume of the prism.



mm^3

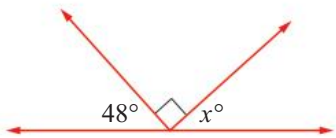
26. [Pythagoras / Trigonometry] *

For this triangle use Pythagoras' theorem $c^2 = a^2 + b^2$. Find the length of the hypotenuse.



27. [Angles] *

Find the value of $x°$.



28. [Geometric Reasoning]

Sketch a hexagonal pyramid. How many edges does a hexagonal pyramid have?

edges =

29. [Statistics] *

Find the median and range of this set of data:
3.1, 3.1, 3.6, 3.6, 3.8, 4, 4.2, 4.5, 4.8, 4.9

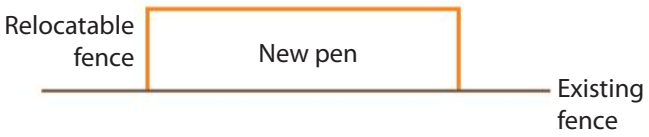
median = range =

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 is a red court card? [Give your answer as a fraction in simplest form.]

31. [Problem Solving 1] *

A farmer wishes to make a rectangular pen using an existing section of straight fence and 36 m of relocatable fencing materials. What is the largest possible area of the pen?



m^2

32. [Problem Solving 2] *

The lines of a multiplication table are shown jumbled below. Which times table is it?

C × A = DI
C × F = ID
C × E = GE
C × H = C
C × C = FH
C × I = BA
C × G = AB
C × B = EG
C × D = HF

MATHS MATE

Term 1 - Sheet 2

Name: .....

Due Date: ...../...../.....

Parent's Signature: .....

1. [Long ×,÷] *

$268 \times 200 =$

2. [Decimal +,–]

$8.074 + 0.705 =$

3. [Decimal ×,÷]

$100 \times 0.35 =$

4. [Fraction +,–] *

$\frac{5}{16} - \frac{1}{16} =$

5. [Fraction ×,÷]

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

6. [Percentages] *

24% of 25 =

7. [Decimals / Fractions / Percentages] *

Complete the equivalent fractions:

$\frac{24}{36} = \frac{\square}{12} = \frac{2}{\square}$

8. [Integer +,–]

$(-10) + (-7) =$

9. [Integer ×,÷]

$(+3) \times (+13) =$

10. [Rates / Ratios] *

On average a horse needs 3 hours of sleep per day, while a python needs 18 hours of sleep per day. What is the ratio of the hours of sleep needed by a horse to the hours of sleep needed by a python?

11. [Indices]

$10^0 =$

12. [Square Roots] *

$\sqrt{1\frac{24}{25}} =$

13. [Exploring Number] *

$5 \times 8 + 6 \div 6 - 12 \times 2 =$

14. [Financial Mathematics] *

Which parking option is cheaper for a 5 hour stay?

Option	Car Parking Rates	Cost
A	Day Rate	$18.00
B	1st hour	$5.00
	Per hour thereafter	$3.00

15. [Number Patterns]

Complete the pattern:

54 , 53 , 51 , 48 , 44 , ___ , ___

16. [Expressions]

Write as an expression:

t subtracted from the product of c and d

17. [Substitution] *

If $w = 5$, find the value of $36 - 4w$

18. [Expansion]

Expand $6(6 + h)$

19. [Factorisation]

Factorise $4j - 10k$

20. [Equations] *

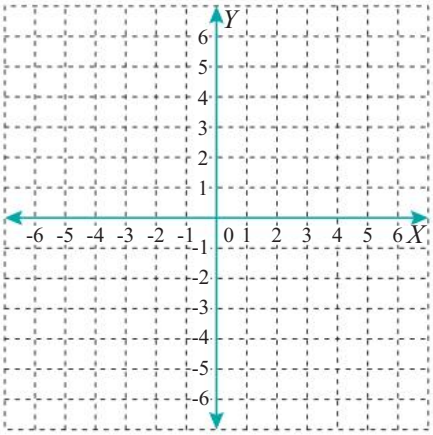
Solve for x: $2 + 3x = -1$

21. [Coordinate Geometry] *

Graph the line of equation $y = -3x - 1$ by first completing this table of values.

[Label the line with the rule.]

x	–2	–1	0	1	2
y	5				



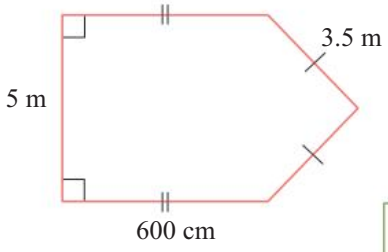
QUOTE OF THE WEEK: Love built on beauty, soon as beauty, dies. John Donne

22. [Units of Measurement / Time]

The symbol 'M' represents which metric prefix of 1 000 000 in value?

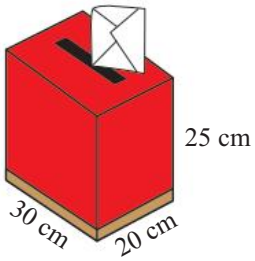
23. [Perimeter / Area] *

Find the perimeter of the shape in centimetres.



24. [Surface Area] *

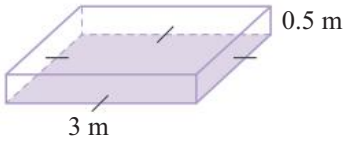
What is the total surface area of the mailbox if the letter opening has an area of 44 cm^2?
[Hint: External area of six faces less opening.]



cm^2

25. [Volume] *

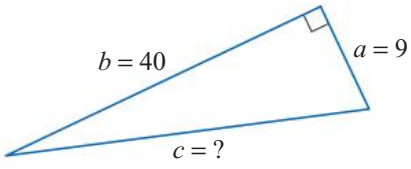
Find the volume of the square prism.



m^3

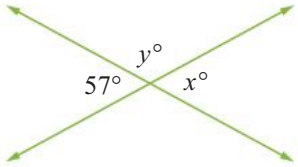
26. [Pythagoras / Trigonometry] *

For this triangle use Pythagoras' theorem $c^2 = a^2 + b^2$. Find the length of the hypotenuse.



27. [Angles] *

Find the values of $x°$ and $y°$.

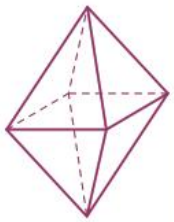


$x° =$ $y° =$

28. [Geometric Reasoning]

Euler's formula, **E** = **V** + **F** − 2 defines the relationship between **E**dges, **V**ertices and **F**aces of any polyhedron. Verify Euler's formula for an octahedron:

□ = □ + □ − 2



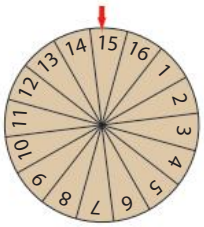
29. [Statistics] *

Calculate the mean and mode of this set of data:
12, 8, 12, 13, 12, 8, 13, 8, 10, 13, 9, 8

mean = mode =

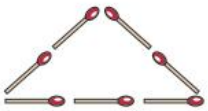
30. [Probability] *

This spinner is spun once. What is the probability of spinning a multiple of 5?
[Give your answer as a fraction.]



31. [Problem Solving 1] *

Seven matchsticks can be used to form a triangular enclosure in two different ways, {3,2,2} and {1,3,3} as shown below.
How many different triangles can be formed using 10 matchsticks?



3,2,2

1,3,3

32. [Problem Solving 2] *

Fill in the missing digits in the multiplication.

$$\begin{array}{rrr} \square & \square & 5 \\ \times & & 4 \\ \hline & \square & 1 \quad 5 \\ \square & 6 & \square \quad 0 \\ \hline 4 & 7 & \square \quad \square \end{array}$$

MATHS MATE

Term 1 - Sheet 3

Name: .....

Due Date: ...../...../.....

Parent's Signature: .....

1. [Long ×,÷] *

$150 \times 4000 =$

2. [Decimal +,−] *

$0.006 + 3.95 =$

3. [Decimal ×,÷]

$1000 \times 8.9 =$

4. [Fraction +,−] *

$\frac{19}{10} - \frac{7}{10} =$

5. [Fraction ×,÷] *

$\frac{4}{5} \times \frac{3}{4} =$

6. [Percentages] *

80% of 5 =

7. [Decimals / Fractions / Percentages] *

$\frac{6 \times 10}{7 \times 10} = \frac{6}{7}$ True or false?

8. [Integer +,−]

$(+17) + (-12) =$

9. [Integer ×,÷]

$(-23) \times (-2) =$

10. [Rates / Ratios] *

In his career, Pete Sampras won 14 Grand Slam titles in 18 finals. What is the ratio of wins to finals played?

11. [Indices]

$\left(\frac{3}{8}\right)^2 =$

12. [Square Roots] *

$\sqrt{30\frac{1}{4}} =$

13. [Exploring Number] *

$20 - 3 \times (3 + 5) \div 4 + 2 =$

14. [Financial Mathematics] *

There is a deal that if you buy books of equal value, the second is half price. This deal costs $17.85. How much does the deal save compared to the original price?

$

15. [Number Patterns]

Complete the pattern:

1 , 12 , 21 , 28 , 33 , ___ , ___

16. [Expressions]

Write as an expression:

5 subtracted from a quarter of s

17. [Substitution] *

If $a = 3$ and $b = 5$,
find the value of $2a + 3b$

18. [Expansion]

Expand $2(7r + 9)$

19. [Factorisation]

Factorise
$2a + 4b + 8$

20. [Equations] *

Solve for x: $\frac{4x}{3} + 5 = 4$

21. [Coordinate Geometry] *

Which line does the point (−1,6) lie on?

A) $y = 5x + 8$
B) $y = -2x - 4$
C) $y = -x + 5$

QUOTE OF THE WEEK: A lot of people get what they want, but they don't always want what they get.

22. [Units of Measurement / Time]

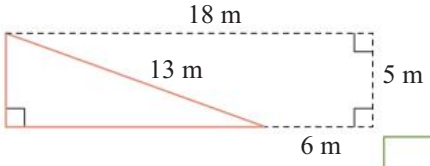
Which number represents the metric prefix 'centi'?

A) 0.1 B) $\frac{1}{100}$

C) $\frac{1}{1000}$ D) 100

23. [Perimeter / Area] *

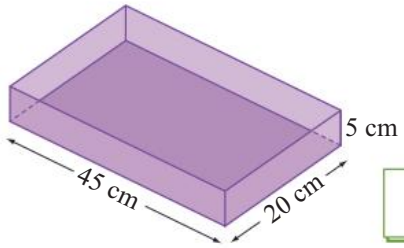
Find the perimeter of the right-angled triangle.



m

24. [Surface Area] *

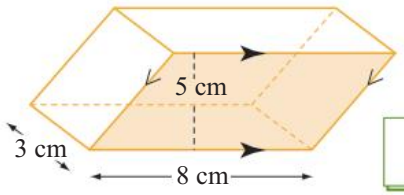
Gina wants to paint this open cardboard box on the inside and the outside. How many square centimetres of cardboard will Gina paint?



cm^2

25. [Volume] *

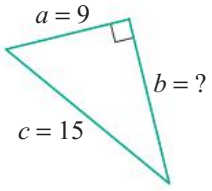
Find the volume of the prism.



cm^3

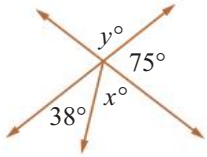
26. [Pythagoras / Trigonometry] *

Using Pythagoras' theorem find the length of the side labelled b.



27. [Angles] *

Find the values of $x°$ and $y°$.



$x° =$ $y° =$

28. [Geometric Reasoning]

Circle the net that **cannot** be folded to make a model of a three-dimensional shape.

29. [Statistics] *

Which set of data has the same mean, median and mode?

A) 98, 99, 100, 100, 102, 103

B) 23, 25, 25, 25, 26, 26

30. [Probability] *

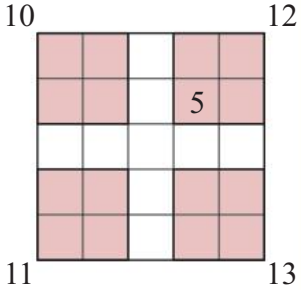
A fly lands on one square of the crossword. What is the probability that the fly lands on a black square? [Give your answer as a fraction in simplest form.]

31. [Problem Solving 1] *

Simplify $\dfrac{5}{1+\dfrac{1}{1+3}}$

32. [Problem Solving 2]

Place all the digits 1 to 5 in each row and column, so that they are not repeated in any of the rows, columns, diagonals and shaded squares. The numbers outside the big square represent the sums of the four digits in each shaded square.



MATHS MATE

Term 1 - Sheet 4

Name: .....

Due Date: ...../...../.....

Parent's Signature: .....

1. [Long ×,÷] *

$2067 \times 300 =$

2. [Decimal +,–]

$1.21 + 12.012 =$

3. [Decimal ×,÷]

$0.004 \times 1000 =$

4. [Fraction +,–] *

$\frac{9}{5} + \frac{6}{5} =$

5. [Fraction ×,÷] *

$\frac{5}{7} \times \frac{7}{8} =$

6. [Percentages] *

15% of $90 =$

7. [Decimals / Fractions / Percentages] *

$\frac{12}{15} = \frac{12 \div 3}{15 \div 3}$ True or false?

8. [Integer +,–]

$(-13) + (+21) =$

9. [Integer ×,÷]

$(+12) \times (-9) =$

10. [Rates / Ratios] *

Plain chocolate is 60% carbohydrates, 35% fat and 5% other components. Find the ratio of carbohydrates to fat to other components.

11. [Indices] *

$\left(\frac{2}{5}\right)^3 =$

12. [Square Roots] *

$\sqrt{3\frac{1}{16}} =$

13. [Exploring Number] *

$(10 - 4)^2 \div (30 - 12) =$

14. [Financial Mathematics] *

The printing costs $1309 including GST. If the GST is 10%, how much is the cost excluding GST?

$

15. [Number Patterns]

Complete the pattern:

45 , 43 , 39 , 33 , 25 , ___ , ___

16. [Expressions]

To hire a car costs $70 per day plus a $40 fee. How much will it be to hire a car for x days?

17. [Substitution] *

If $a = 2$ and $b = 6$, find the value of $12 - ab$

18. [Expansion]

Expand $5(6 - 3e + 2f)$

19. [Factorisation]

Factorise $12j^2 + 18k - 9l$

20. [Equations] *

Solve for x: $\frac{9 + 6x}{7} = 2$

21. [Coordinate Geometry] *

Which of these points lie on the line defined by the rule $y = -2x - 3$?

A(3,–9)
B(0,3)
C(–2,1)

and

QUOTE OF THE WEEK: When people cease to believe in God, they will believe in anything. G. K. Chesterton

22. [Units of Measurement / Time]

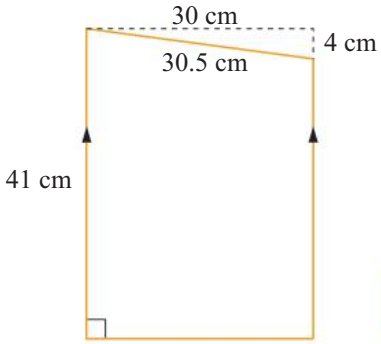
Which number represents the metric prefix 'milli'?

A) 0.001 B) $\frac{1}{100}$

C) $\frac{1}{10}$ D) 1000

23. [Perimeter / Area] *

Find the perimeter of the trapezium.



cm

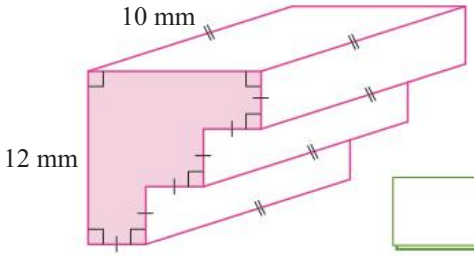
24. [Surface Area] *

The faces of a Rubik's cube are covered by square stickers of one of six colours. What is the total surface area covered by the stickers?

cm^2

25. [Volume] *

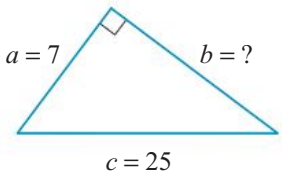
Find the volume of the prism.



mm^3

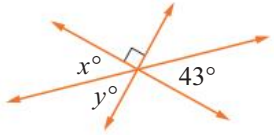
26. [Pythagoras / Trigonometry] *

Using Pythagoras' theorem find the length of the side labelled *b*.



27. [Angles] *

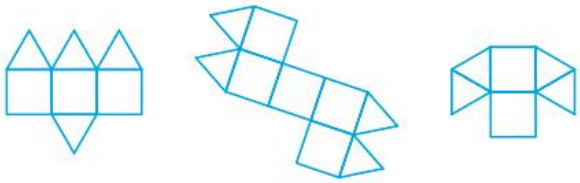
Find the values of $x°$ and $y°$.



$x° =$ $y° =$

28. [Geometric Reasoning]

Circle the net that **can** be folded to make a model of a three-dimensional shape.



29. [Statistics] *

Which set of data has the same mean, median and mode?

A) 12, 14, 15, 15, 15

B) 10, 10, 11, 11, 11, 12, 12

30. [Probability] *

A dart board has sections of identical size, numbered 1 to 20. A dart is thrown and hits the board. What is the probability that the dart lands inside a prime number section?

[Give your answer as a fraction in simplest form.]

31. [Problem Solving 1] *

Spanner's average rose from 7 goals per match to 8 after the fifth match. How many goals did Spanner kick in the fifth match?

32. [Problem Solving 2] *

Rod works for 15 days and Mary for 10 days to arrange a total of 1300 books on the library's shelves. They both work at different rates. Over the same period of time, Rod arranges 4 books for every 7 books that Mary arranges. How many books did Mary arrange altogether?

MATHS MATE

Test 1

Covering worksheets 1.1 - 1.4

Name: .....

1. [Long ×,÷]

$347 \times 300 =$

2. [Decimal +,–]

$0.547 + 11.06 =$

3. [Decimal ×,÷]

$0.37 \times 1000 =$

4. [Fraction +,–]

$\frac{7}{4} + \frac{9}{4} =$

5. [Fraction ×,÷]

$\frac{1}{5} \times \frac{5}{6} =$

6. [Percentages]

12% of 80 =

7. [Decimals / Fractions / Percentages]

$\frac{2+10}{3+10} = \frac{2}{3}$ True or false?

8. [Integer +,–]

$(-16) + (+7) =$

9. [Integer ×,÷]

$(-6) \times (+10) =$

10. [Rates / Ratios]

Of the 206 bones in the human body 14 are in the face. Find the ratio of bones in the face to the total number of bones.

11. [Indices]

$\left(\frac{4}{5}\right)^2 =$

12. [Square Roots]

$\sqrt{1\frac{9}{16}} =$

13. [Exploring Number]

$36 - 2 \times (3 + 5) \div 4 + 6 =$

14. [Financial Mathematics]

The printing costs $1353 including GST. If the GST is 10%, how much is the cost excluding GST?

$

15. [Number Patterns]

Complete the pattern:

28 , 27 , 25 , 22 , 18 , ___ , ___

16. [Expressions]

Write as an expression:

5 more than the product of g and h

17. [Substitution]

If $a = 1$ and $b = 4$,
find the value of $6b - a$

18. [Expansion]

Expand $3(6a - 5)$

19. [Factorisation]

Factorise $3x - 15y + 9$

20. [Equations]

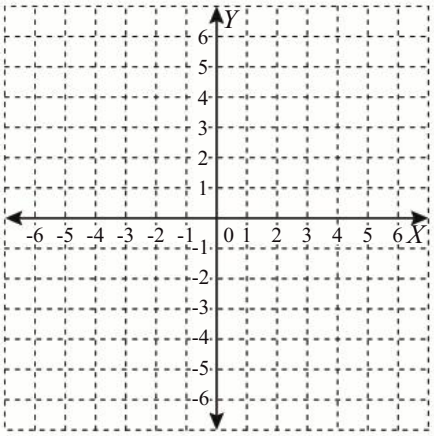
Solve for x: $\frac{5x}{2} - 1 = 1$

21. [Coordinate Geometry]

Graph the line of equation $y = 2x + 1$ by first completing this table of values.

[Label the line with the rule.]

x	–2	–1	0	1	2
y	–3				

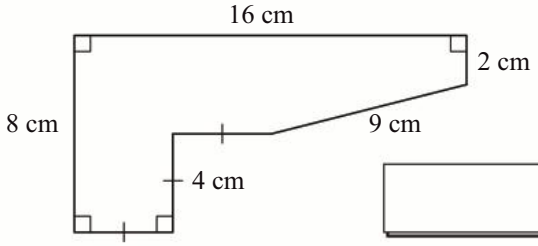


22. [Units of Measurement / Time]

Which metric prefix is used to describe one hundredth of a standard unit?

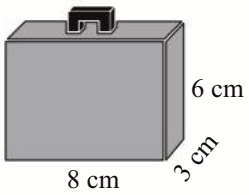
23. [Perimeter / Area]

Find the perimeter of the shape in centimetres.



24. [Surface Area]

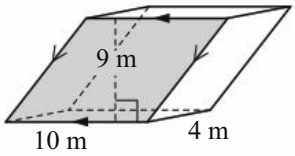
Find the total surface area of the suitcase.



cm^2

25. [Volume]

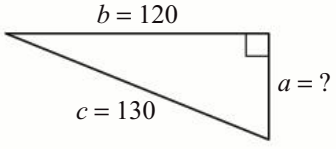
Find the volume of the prism using $V = Bh$.



m^3

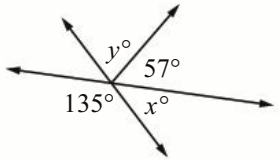
26. [Pythagoras / Trigonometry]

For this triangle use Pythagoras' theorem $a^2 + b^2 = c^2$. Find the length of the hypotenuse.



27. [Angles]

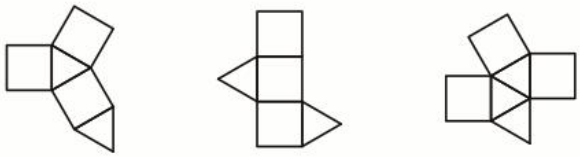
Find the values of $x°$ and $y°$.



$x° =$ $y° =$

28. [Geometric Reasoning]

Circle the net that **cannot** be folded to make a model of a triangular prism.



29. [Statistics]

Which set of data has the same mean, median and mode?

A) 5, 7, 8, 10, 10
B) 1, 3, 3, 3, 5

30. [Probability]

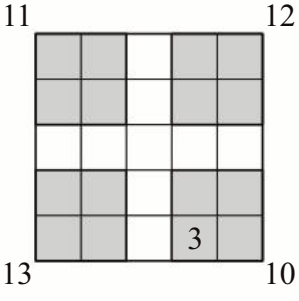
A fly lands on one square of the chess board. What is the probability that it lands on an empty square? [Give the answer as a fraction in simplest form.]

31. [Problem Solving 1]

Nine matchsticks are used to represent a cube as shown. Show how you would move three matches to form 3 equilateral triangles.

32. [Problem Solving 2]

Place all the digits 1 to 5 in each row and column, so that they are not repeated in any of the rows, columns, diagonals and shaded squares. The numbers outside the big square represent the sums of the four digits in each shaded square.



MATHS MATE

Test 1

Covering worksheets 1.1 - 1.4

Name: .....

1. [Long ×,÷]
$459 \times 200 =$

2. [Decimal +,–]
$0.093 + 13.74 =$

3. [Decimal ×,÷]
$1000 \times 2.8 =$

4. [Fraction +,–]
$\frac{5}{6} + \frac{7}{6} =$

5. [Fraction ×,÷]
$\frac{6}{7} \times \frac{5}{6} =$

6. [Percentages]
9% of 30 =

7. [Decimals / Fractions / Percentages]
$\frac{3 \times 6}{5 \times 6} = \frac{3}{5}$ True or false?

8. [Integer +,–]
$(-14) + (+8) =$

9. [Integer ×,÷]
$(-3) \times (+21) =$

10. [Rates / Ratios]
Of the 206 bones in the human body 106 are in the hands and feet. Find the ratio of bones in the hands and feet to the total number of bones.

11. [Indices]
$\left(\frac{3}{10}\right)^3 =$

12. [Square Roots]
$\sqrt{3\frac{6}{25}} =$

13. [Exploring Number]
$8 + 4 \times 6 - 2 \times (3 + 4) =$

14. [Financial Mathematics]
The printing costs $968 including GST. If the GST is 10%, how much is the cost excluding GST?
$

15. [Number Patterns]
Complete the pattern:
50 , 49 , 46 , 41 , 34 , ___ , ___

16. [Expressions]
Write as an expression:
8 more than seven lots of x

17. [Substitution]
If $a = 7$ and $b = 3$,
find the value of $4b - 3a$

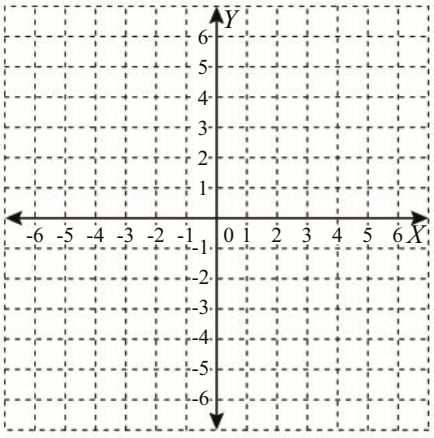
18. [Expansion]
Expand $4(4z - 3)$

19. [Factorisation]
Factorise $4d - 12e + 4$

20. [Equations]
Solve for x: $\frac{3x}{2} + 6 = 7$

21. [Coordinate Geometry]
Graph the line of equation $y = 2x - 3$ by first completing this table of values.
[Label the line with the rule.]

x	–2	–1	0	1	2
y	–7				

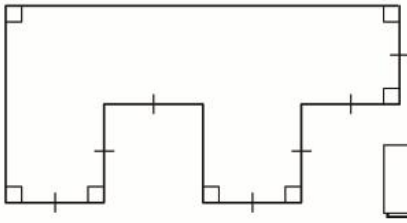


22. [Units of Measurement / Time]

Which metric prefix is used to describe one thousandth of a standard unit?

23. [Perimeter / Area]

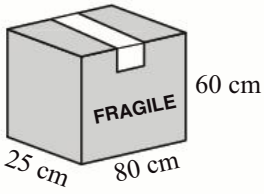
Find the perimeter of the polygon.



mm

24. [Surface Area]

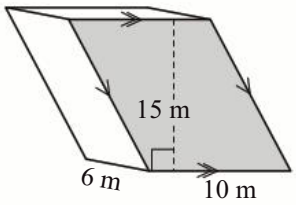
What is the total surface area of the cardboard box?



cm^2

25. [Volume]

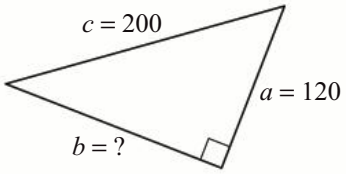
Find the volume of the prism using $V = Bh$.



m^3

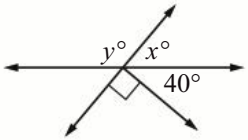
26. [Pythagoras / Trigonometry]

For this triangle use Pythagoras' theorem $a^2 + b^2 = c^2$. Find the length of the side labelled b.



27. [Angles]

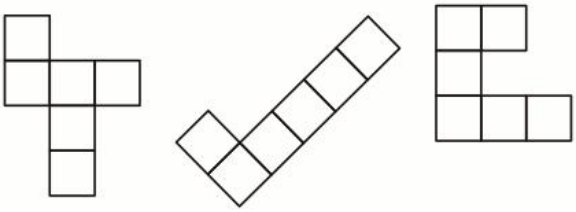
Find the values of $x°$ and $y°$.



$x° =$ $y° =$

28. [Geometric Reasoning]

Circle the net that **can** be folded to make a model of a cube.



29. [Statistics]

Which set of data has the same mean, median and mode?

A) 6, 7, 8, 8, 11

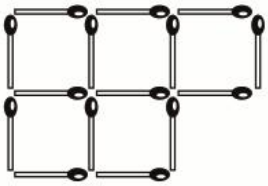
B) 5, 5, 8, 11, 11

30. [Probability]

A dart board has 20 numbered sections of identical size. A dart is thrown and hits the board. What is the probability that the dart lands inside a section with a number less than 12? [Give the answer as a fraction in simplest form.]

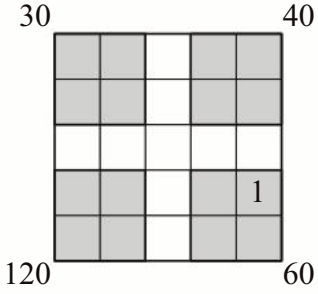
31. [Problem Solving 1]

Which four matches should you remove to leave exactly two squares?



32. [Problem Solving 2]

Place all the digits 1 to 5 in each row and column, so that they are not repeated in any of the rows, columns, diagonals and shaded squares. The numbers outside the big square represent the products of the four digits in each shaded square.



MATHS MATE

Term 1 - Sheet 1

Name: .....

Due Date: ...../...../.....

Parent's Signature: .....

1. [Long ×,÷]
$902 \times 1000 =$ **902 000**

2. [Decimal +,–] *
$13.87 + 6.9 =$ **20.77**

3. [Decimal ×,÷]
$10 \times 0.064 =$ **0.64**

4. [Fraction +,–] *
$\frac{4}{15} + \frac{1}{15} =$ **$\frac{1}{3}$**

5. [Fraction ×,÷]
$\frac{2}{5} \times \frac{2}{7} =$ **$\frac{4}{35}$**

6. [Percentages] *
40% of 600 = **240**

7. [Decimals / Fractions / Percentages] *
Complete the equivalent fractions:
$\frac{3}{5} = \frac{9}{\mathbf{15}} = \frac{\mathbf{36}}{60}$

8. [Integer +,–]
$(-14) + (+11) =$ **–3**

9. [Integer ×,÷]
$(-7) \times (+11) =$ **–77**

10. [Rates / Ratios] *
Simplify $4 : 50¢ : 2.50$ **8 : 1 : 5**

11. [Indices] *
$4^4 =$ **256**

12. [Square Roots] *
$\sqrt{\frac{25}{64}} =$ **$\frac{5}{8}$**

13. [Exploring Number] *
$6 + 8 - (11 - 5) =$ **8**

14. [Financial Mathematics] *
Charlie paid a $200 deposit for a lay-by on a $2500 computer as the store demanded. What percentage of the sale price does the store expect on lay-by?
8%

15. [Number Patterns]
Complete the pattern:
0 , 2 , 6 , 12 , 20 , **30 , 42**

16. [Expressions]
Write as an expression:
3 times the product of m and n
or $3 \times m \times n$ **$3mn$**

17. [Substitution] *
If $x = 3$, find the value of $5x - 8$ **7**

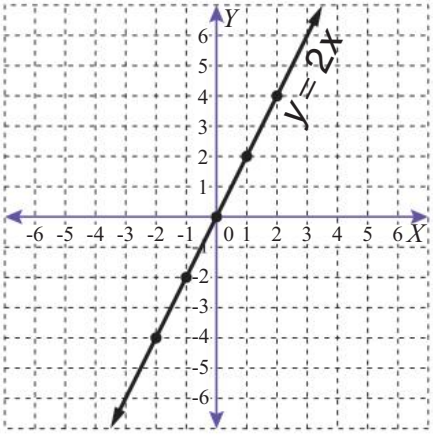
18. [Expansion]
Expand $4(k - 5)$ **$4k - 20$**

19. [Factorisation]
Factorise $3r + 9s$ **$3(r + 3s)$**

20. [Equations] *
Solve for x: $4x - 3 = 0$ **$\frac{3}{4}$**

21. [Coordinate Geometry] *
Graph the line of equation $y = 2x$ by first completing this table of values.
[Label the line with the rule.]

x	–2	–1	0	1	2
y	–4	–2	0	2	4



QUOTE OF THE WEEK: A wise man makes his own decisions, an ignorant man follows the public opinion. Chinese Proverb

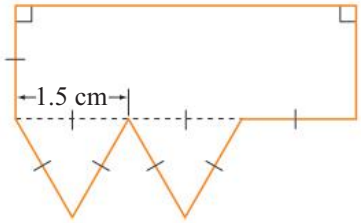
22. [Units of Measurement / Time]

Which metric prefix is used to describe 1000 standard units?

kilo

23. [Perimeter / Area] *

Find the perimeter of the polygon.



15 cm

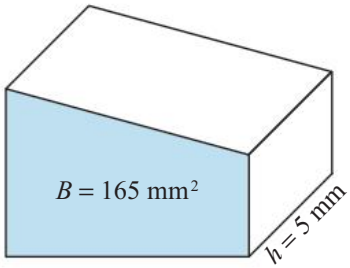
24. [Surface Area] *

Find the total surface area of a detergent box of width 80 mm, length 200 mm and height 150 mm.

116 000 mm^2

25. [Volume] *

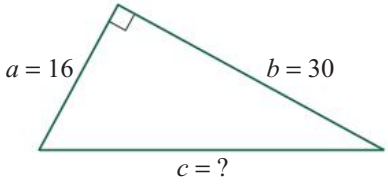
Using $V = Bh$ find the volume of the prism.



825 mm^3

26. [Pythagoras / Trigonometry] *

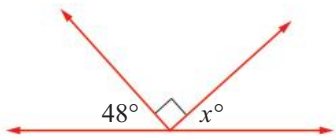
For this triangle use Pythagoras' theorem $c^2 = a^2 + b^2$. Find the length of the hypotenuse.



34

27. [Angles] *

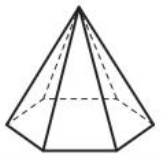
Find the value of $x°$.



42°

28. [Geometric Reasoning]

Sketch a hexagonal pyramid. How many edges does a hexagonal pyramid have?



edges = 12

29. [Statistics] *

Find the median and range of this set of data:
3.1, 3.1, 3.6, 3.6, 3.8, 4, 4.2, 4.5, 4.8, 4.9

median = 3.9 range = 1.8

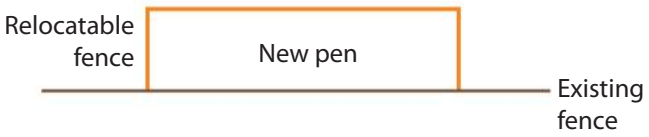
30. [Probability] *

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 is a red court card? [Give your answer as a fraction in simplest form.]

$\frac{3}{26}$

31. [Problem Solving 1] *

A farmer wishes to make a rectangular pen using an existing section of straight fence and 36 m of relocatable fencing materials. What is the largest possible area of the pen?



162 m^2

32. [Problem Solving 2] *

The lines of a multiplication table are shown jumbled below. Which times table is it?

C × A = DI
C × F = ID
C × E = GE
C × H = C
C × C = FH
C × I = BA
C × G = AB
C × B = EG
C × D = HF

9

MATHS MATE

Term 1 - Sheet 2

Name: .....

Due Date: ...../...../.....

Parent's Signature: .....

1. [Long ×,÷] *

$268 \times 200 =$

53 600

2. [Decimal +,–]

$8.074 + 0.705 =$

8.779

3. [Decimal ×,÷]

$100 \times 0.35 =$

35

4. [Fraction +,–] *

$\frac{5}{16} - \frac{1}{16} =$

$\frac{1}{4}$

5. [Fraction ×,÷]

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

$\frac{3}{20}$

6. [Percentages] *

24% of 25 =

6

7. [Decimals / Fractions / Percentages] *

Complete the equivalent fractions:

$\frac{24}{36} = \frac{8}{12} = \frac{2}{3}$

8. [Integer +,–]

$(-10) + (-7) =$

–17

9. [Integer ×,÷]

$(+3) \times (+13) =$

39

10. [Rates / Ratios] *

On average a horse needs 3 hours of sleep per day, while a python needs 18 hours of sleep per day. What is the ratio of the hours of sleep needed by a horse to the hours of sleep needed by a python?

1 : 6

11. [Indices]

$10^0 =$

1

12. [Square Roots] *

$\sqrt{1\frac{24}{25}} =$

$1\frac{2}{5}$

13. [Exploring Number] *

$5 \times 8 + 6 \div 6 - 12 \times 2 =$

17

14. [Financial Mathematics] *

Which parking option is cheaper for a 5 hour stay?

Option	Car Parking Rates	Cost
A	Day Rate	$18.00
B	1st hour	$5.00
	Per hour thereafter	$3.00

B

15. [Number Patterns]

Complete the pattern:

54 , 53 , 51 , 48 , 44 , 39 , 33

16. [Expressions]

Write as an expression:

t subtracted from the product of c and d

or $c \times d - t$ $cd - t$

17. [Substitution] *

If $w = 5$, find the value of $36 - 4w$

16

18. [Expansion]

Expand $6(6 + h)$

$36 + 6h$

19. [Factorisation]

Factorise $4j - 10k$

$2(2j - 5k)$

20. [Equations] *

Solve for x: $2 + 3x = -1$

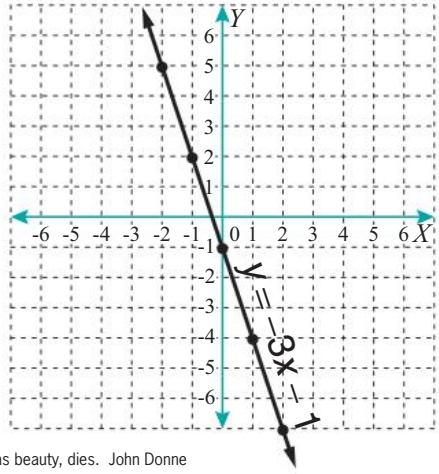
–1

21. [Coordinate Geometry] *

Graph the line of equation $y = -3x - 1$ by first completing this table of values.

[Label the line with the rule.]

x	–2	–1	0	1	2
y	5	2	–1	–4	–7



QUOTE OF THE WEEK: Love built on beauty, soon as beauty, dies. John Donne

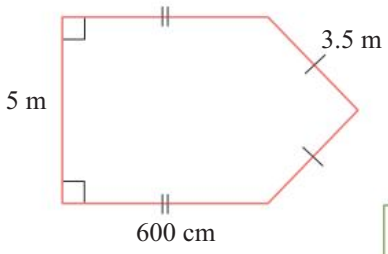
22. [Units of Measurement / Time]

The symbol 'M' represents which metric prefix of 1 000 000 in value?

Mega

23. [Perimeter / Area] *

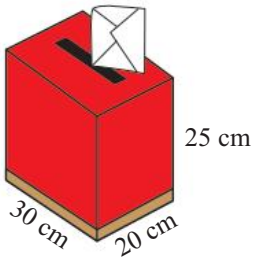
Find the perimeter of the shape in centimetres.



2400 cm

24. [Surface Area] *

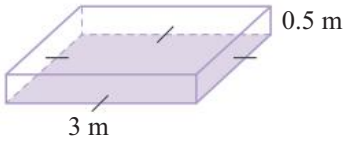
What is the total surface area of the mailbox if the letter opening has an area of 44 cm^2?
[Hint: External area of six faces less opening.]



3656 cm^2

25. [Volume] *

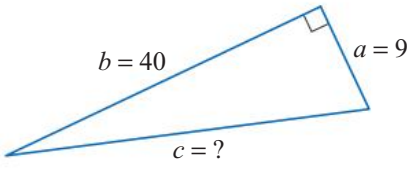
Find the volume of the square prism.



4.5 m^3

26. [Pythagoras / Trigonometry] *

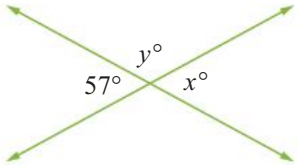
For this triangle use Pythagoras' theorem $c^2 = a^2 + b^2$. Find the length of the hypotenuse.



41

27. [Angles] *

Find the values of $x°$ and $y°$.

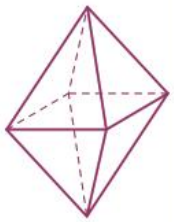


$x° = 57°$ $y° = 123°$

28. [Geometric Reasoning]

Euler's formula, **E** = **V** + **F** − 2 defines the relationship between **E**dges, **V**ertices and **F**aces of any polyhedron. Verify Euler's formula for an octahedron:

12 = 6 + 8 − 2



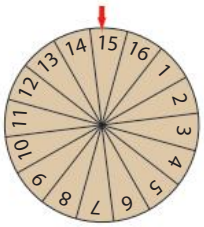
29. [Statistics] *

Calculate the mean and mode of this set of data:
12, 8, 12, 13, 12, 8, 13, 8, 10, 13, 9, 8

mean = 10.5 mode = 8

30. [Probability] *

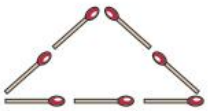
This spinner is spun once. What is the probability of spinning a multiple of 5?
[Give your answer as a fraction.]



$\frac{3}{16}$

31. [Problem Solving 1] *

Seven matchsticks can be used to form a triangular enclosure in two different ways, {3,2,2} and {1,3,3} as shown below.
How many different triangles can be formed using 10 matchsticks?



3,2,2 1,3,3

2

32. [Problem Solving 2] *

Fill in the missing digits in the multiplication.

	1	1	5
×		4	1
	1	1	5
4	6	0	0
4	7	1	5

MATHS MATE

Term 1 - Sheet 3

Name: .....

Due Date: ...../...../.....

Parent's Signature: .....

1. [Long ×,÷] *

$150 \times 4000 =$

600 000

2. [Decimal +,−] *

$0.006 + 3.95 =$

3.956

3. [Decimal ×,÷]

$1000 \times 8.9 =$

8900

4. [Fraction +,−] *

$\frac{19}{10} - \frac{7}{10} =$

$1\frac{1}{5}$

5. [Fraction ×,÷] *

$\frac{4}{5} \times \frac{3}{4} =$

$\frac{3}{5}$

6. [Percentages] *

80% of 5 =

4

7. [Decimals / Fractions / Percentages] *

$\frac{6 \times 10}{7 \times 10} = \frac{6}{7}$ True or false?

true

8. [Integer +,−]

$(+17) + (-12) =$

5

9. [Integer ×,÷]

$(-23) \times (-2) =$

46

10. [Rates / Ratios] *

In his career, Pete Sampras won 14 Grand Slam titles in 18 finals. What is the ratio of wins to finals played?

7 : 9

11. [Indices]

$\left(\frac{3}{8}\right)^2 =$

$\frac{9}{64}$

12. [Square Roots] *

$\sqrt{30\frac{1}{4}} =$

$5\frac{1}{2}$

13. [Exploring Number] *

$20 - 3 \times (3 + 5) \div 4 + 2 =$

16

14. [Financial Mathematics] *

There is a deal that if you buy books of equal value, the second is half price. This deal costs $17.85. How much does the deal save compared to the original price?

$ 5.95

15. [Number Patterns]

Complete the pattern:

1 , 12 , 21 , 28 , 33 , 36 , 37

16. [Expressions]

Write as an expression:

5 subtracted from a quarter of s

$\frac{s}{4} - 5$

17. [Substitution] *

If $a = 3$ and $b = 5$,
find the value of $2a + 3b$

21

18. [Expansion]

Expand $2(7r + 9)$

$14r + 18$

19. [Factorisation]

Factorise
$2a + 4b + 8$

$2(a + 2b + 4)$

20. [Equations] *

Solve for x: $\frac{4x}{3} + 5 = 4$

$-\frac{3}{4}$

21. [Coordinate Geometry] *

Which line does the point (−1,6) lie on?

A) $y = 5x + 8$
B) $y = -2x - 4$
C) $y = -x + 5$

C

QUOTE OF THE WEEK: A lot of people get what they want, but they don't always want what they get.

22. [Units of Measurement / Time]

Which number represents the metric prefix 'centi'?

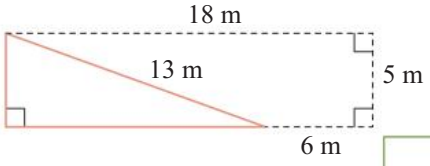
A) 0.1 B) $\frac{1}{100}$

C) $\frac{1}{1000}$ D) 100

B

23. [Perimeter / Area] *

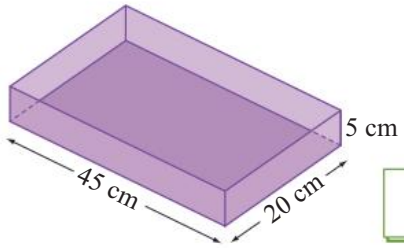
Find the perimeter of the right-angled triangle.



30 m

24. [Surface Area] *

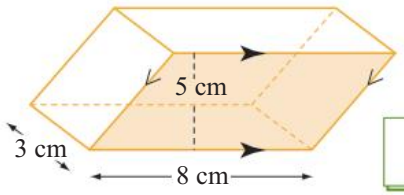
Gina wants to paint this open cardboard box on the inside and the outside. How many square centimetres of cardboard will Gina paint?



3100 cm^2

25. [Volume] *

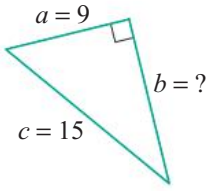
Find the volume of the prism.



120 cm^3

26. [Pythagoras / Trigonometry] *

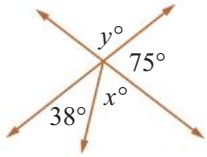
Using Pythagoras' theorem find the length of the side labelled b.



12

27. [Angles] *

Find the values of $x°$ and $y°$.



$x° = 67° y° = 105°$

28. [Geometric Reasoning]

Circle the net that **cannot** be folded to make a model of a three-dimensional shape.

29. [Statistics] *

Which set of data has the same mean, median and mode?

A) 98, 99, 100, 100, 102, 103

B) 23, 25, 25, 25, 26, 26

B

30. [Probability] *

A fly lands on one square of the crossword. What is the probability that the fly lands on a black square? [Give your answer as a fraction in simplest form.]

$\frac{1}{3}$

31. [Problem Solving 1] *

Simplify $\dfrac{5}{1+\dfrac{1}{1+3}}$

4

32. [Problem Solving 2]

Place all the digits 1 to 5 in each row and column, so that they are not repeated in any of the rows, columns, diagonals and shaded squares. The numbers outside the big square represent the sums of the four digits in each shaded square.

10					12
	2	3	5	1	4
	1	4	3	5	2
	4	5	1	2	3
	5	2	4	3	1
	3	1	2	4	5
11					13

MATHS MATE

Term 1 - Sheet 4

Name: .....

Due Date: ...../...../.....

Parent's Signature: .....

1. [Long ×,÷] *

$2067 \times 300 =$

620 100

2. [Decimal +,−]

$1.21 + 12.012 =$

13.222

3. [Decimal ×,÷]

$0.004 \times 1000 =$

4

4. [Fraction +,−] *

$\frac{9}{5} + \frac{6}{5} =$

3

5. [Fraction ×,÷] *

$\frac{5}{7} \times \frac{7}{8} =$

$\frac{5}{8}$

6. [Percentages] *

15% of $90 =$

13.5

7. [Decimals / Fractions / Percentages] *

$\frac{12}{15} = \frac{12 \div 3}{15 \div 3}$ True or false?

true

8. [Integer +,−]

$(-13) + (+21) =$

8

9. [Integer ×,÷]

$(+12) \times (-9) =$

−108

10. [Rates / Ratios] *

Plain chocolate is 60% carbohydrates, 35% fat and 5% other components. Find the ratio of carbohydrates to fat to other components.

12 : 7 : 1

11. [Indices] *

$\left(\frac{2}{5}\right)^3 =$

$\frac{8}{125}$

12. [Square Roots] *

$\sqrt{3\frac{1}{16}} =$

$1\frac{3}{4}$

13. [Exploring Number] *

$(10 - 4)^2 \div (30 - 12) =$

2

14. [Financial Mathematics] *

The printing costs \$1309 including GST. If the GST is 10%, how much is the cost excluding GST?

\$ 1190

15. [Number Patterns]

Complete the pattern:

45 , 43 , 39 , 33 , 25 , 15 , 3

16. [Expressions]

To hire a car costs \$70 per day plus a \$40 fee. How much will it be to hire a car for x days?

or $70 \times x + 40$ $70x + 40$

17. [Substitution] *

If $a = 2$ and $b = 6$, find the value of $12 - ab$

0

18. [Expansion]

Expand $5(6 - 3e + 2f)$

$30 - 15e + 10f$

19. [Factorisation]

Factorise $12j^2 + 18k - 9l$

$3(4j^2 + 6k - 3l)$

20. [Equations] *

Solve for x: $\frac{9 + 6x}{7} = 2$

$\frac{5}{6}$

21. [Coordinate Geometry] *

Which of these points lie on the line defined by the rule $y = -2x - 3$?

A(3,−9)
B(0,3)
C(−2,1)

A and C

QUOTE OF THE WEEK: When people cease to believe in God, they will believe in anything. G. K. Chesterton

22. [Units of Measurement / Time]

Which number represents the metric prefix 'milli'?

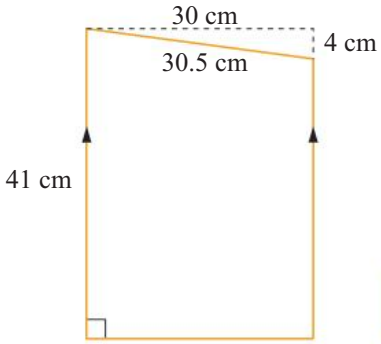
A) 0.001 B) $\frac{1}{100}$

C) $\frac{1}{10}$ D) 1000

A

23. [Perimeter / Area] *

Find the perimeter of the trapezium.



138.5 cm

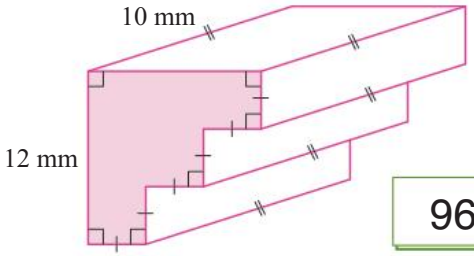
24. [Surface Area] *

The faces of a Rubik's cube are covered by square stickers of one of six colours. What is the total surface area covered by the stickers?

121.5 cm^2

25. [Volume] *

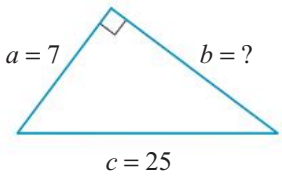
Find the volume of the prism.



960 mm^3

26. [Pythagoras / Trigonometry] *

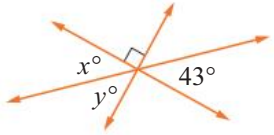
Using Pythagoras' theorem find the length of the side labelled b.



24

27. [Angles] *

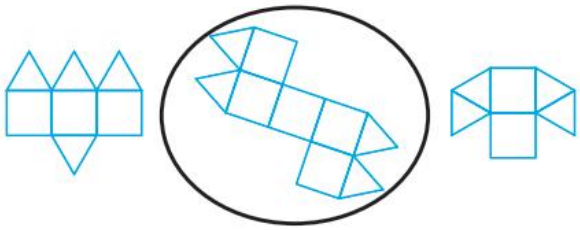
Find the values of $x°$ and $y°$.



$x° = 43°$ $y° = 47°$

28. [Geometric Reasoning]

Circle the net that **can** be folded to make a model of a three-dimensional shape.



29. [Statistics] *

Which set of data has the same mean, median and mode?

A) 12, 14, 15, 15, 15

B) 10, 10, 11, 11, 11, 12, 12

B

30. [Probability] *

A dart board has sections of identical size, numbered 1 to 20. A dart is thrown and hits the board. What is the probability that the dart lands inside a prime number section?

[Give your answer as a fraction in simplest form.]

$\frac{2}{5}$

31. [Problem Solving 1] *

Spanner's average rose from 7 goals per match to 8 after the fifth match. How many goals did Spanner kick in the fifth match?

12

32. [Problem Solving 2] *

Rod works for 15 days and Mary for 10 days to arrange a total of 1300 books on the library's shelves. They both work at different rates. Over the same period of time, Rod arranges 4 books for every 7 books that Mary arranges. How many books did Mary arrange altogether?

700

MATHS MATE

Test 1

Covering worksheets 1.1 - 1.4

Name: .....

1. [Long ×,÷]
$347 \times 300 =$ **104 100**

2. [Decimal +,–]
$0.547 + 11.06 =$ **11.607**

3. [Decimal ×,÷]
$0.37 \times 1000 =$ **370**

4. [Fraction +,–]
$\frac{7}{4} + \frac{9}{4} =$ **4**

5. [Fraction ×,÷]
$\frac{1}{5} \times \frac{5}{6} =$ $\frac{1}{6}$

6. [Percentages]
12% of $80 =$ **9.6**

7. [Decimals / Fractions / Percentages]
$\frac{2+10}{3+10} = \frac{2}{3}$ True or false? **false**

8. [Integer +,–]
$(-16) + (+7) =$ **–9**

9. [Integer ×,÷]
$(-6) \times (+10) =$ **–60**

10. [Rates / Ratios]
Of the 206 bones in the human body 14 are in the face. Find the ratio of bones in the face to the total number of bones. **7 : 103**

11. [Indices]
$\left(\frac{4}{5}\right)^2 =$ $\frac{16}{25}$

12. [Square Roots]
$\sqrt{1\frac{9}{16}} =$ $1\frac{1}{4}$

13. [Exploring Number]
$36 - 2 \times (3 + 5) \div 4 + 6 =$ **38**

14. [Financial Mathematics]
The printing costs \$1353 including GST. If the GST is 10%, how much is the cost excluding GST? **\$ 1230**

15. [Number Patterns]
Complete the pattern:
28 , 27 , 25 , 22 , 18 , **13 , 7**

16. [Expressions]
Write as an expression:
5 more than the product of g and h
or $g \times h + 5$ **$gh + 5$**

17. [Substitution]
If $a = 1$ and $b = 4$,
find the value of $6b - a$ **23**

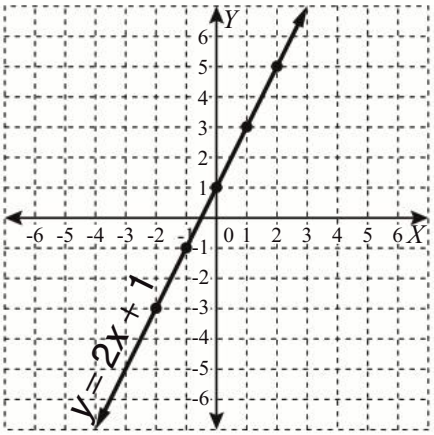
18. [Expansion]
Expand $3(6a - 5)$ **$18a - 15$**

19. [Factorisation]
Factorise $3x - 15y + 9$ **$3(x - 5y + 3)$**

20. [Equations]
Solve for x: $\frac{5x}{2} - 1 = 1$ $\frac{4}{5}$

21. [Coordinate Geometry]
Graph the line of equation $y = 2x + 1$ by first completing this table of values.
[Label the line with the rule.]

x	–2	–1	0	1	2
y	–3	–1	1	3	5



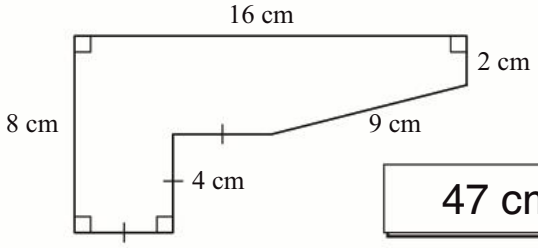
22. [Units of Measurement / Time]

Which metric prefix is used to describe one hundredth of a standard unit?

centi

23. [Perimeter / Area]

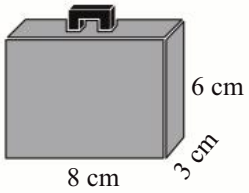
Find the perimeter of the shape in centimetres.



47 cm

24. [Surface Area]

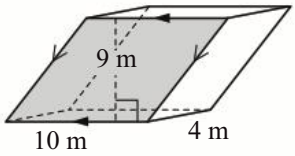
Find the total surface area of the suitcase.



180 cm^2

25. [Volume]

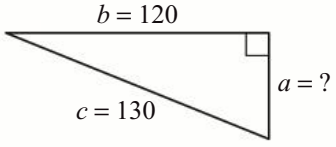
Find the volume of the prism using $V = Bh$.



360 m^3

26. [Pythagoras / Trigonometry]

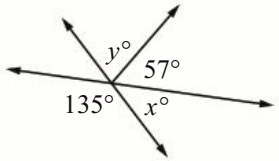
For this triangle use Pythagoras' theorem $a^2 + b^2 = c^2$. Find the length of the hypotenuse.



50

27. [Angles]

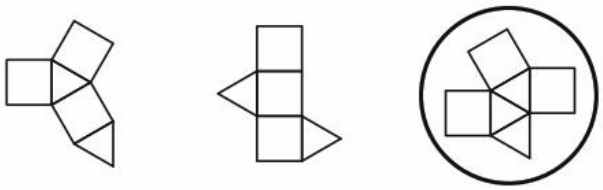
Find the values of $x°$ and $y°$.



$x° = 45°$ $y° = 78°$

28. [Geometric Reasoning]

Circle the net that **cannot** be folded to make a model of a triangular prism.



29. [Statistics]

Which set of data has the same mean, median and mode?

A) 5, 7, 8, 10, 10
B) 1, 3, 3, 3, 5

B

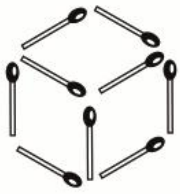
30. [Probability]

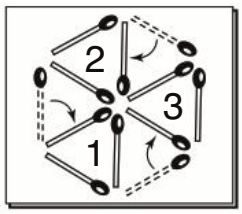
A fly lands on one square of the chess board. What is the probability that it lands on an empty square? [Give the answer as a fraction in simplest form.]

$\frac{1}{2}$

31. [Problem Solving 1]

Nine matchsticks are used to represent a cube as shown. Show how you would move three matches to form 3 equilateral triangles.





32. [Problem Solving 2]

Place all the digits 1 to 5 in each row and column, so that they are not repeated in any of the rows, columns, diagonals and shaded squares. The numbers outside the big square represent the sums of the four digits in each shaded square.

11				12
3	2	4	1	5
1	5	3	2	4
2	4	1	5	3
5	3	2	4	1
4	1	5	3	2
13				10

MATHS MATE

Test 1

Covering worksheets 1.1 - 1.4

Name: .....

1. [Long ×,÷]
$459 \times 200 =$ **91 800**

2. [Decimal +,–]
$0.093 + 13.74 =$ **13.833**

3. [Decimal ×,÷]
$1000 \times 2.8 =$ **2800**

4. [Fraction +,–]
$\frac{5}{6} + \frac{7}{6} =$ **2**

5. [Fraction ×,÷]
$\frac{6}{7} \times \frac{5}{6} =$ $\frac{5}{7}$

6. [Percentages]
9% of 30 = **2.7**

7. [Decimals / Fractions / Percentages]
$\frac{3 \times 6}{5 \times 6} = \frac{3}{5}$ True or false? **true**

8. [Integer +,–]
$(-14) + (+8) =$ **–6**

9. [Integer ×,÷]
$(-3) \times (+21) =$ **–63**

10. [Rates / Ratios]
Of the 206 bones in the human body 106 are in the hands and feet. Find the ratio of bones in the hands and feet to the total number of bones.
53 : 103

11. [Indices]
$\left(\frac{3}{10}\right)^3 =$ $\frac{27}{1000}$

12. [Square Roots]
$\sqrt{3\frac{6}{25}} =$ $1\frac{4}{5}$

13. [Exploring Number]
$8 + 4 \times 6 - 2 \times (3 + 4) =$ **18**

14. [Financial Mathematics]
The printing costs \$968 including GST. If the GST is 10%, how much is the cost excluding GST?
\$ 880

15. [Number Patterns]
Complete the pattern:
50 , 49 , 46 , 41 , 34 , **25 , 14**

16. [Expressions]
Write as an expression:
8 more than seven lots of x
or $7 \times x + 8$ **$7x + 8$**

17. [Substitution]
If $a = 7$ and $b = 3$,
find the value of $4b - 3a$
–9

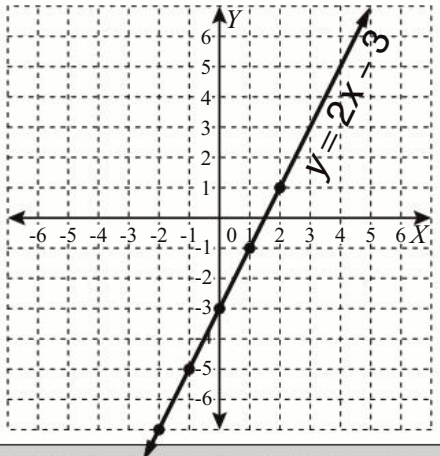
18. [Expansion]
Expand $4(4z - 3)$ **$16z - 12$**

19. [Factorisation]
Factorise $4d - 12e + 4$ **$4(d - 3e + 1)$**

20. [Equations]
Solve for x: $\frac{3x}{2} + 6 = 7$ $\frac{2}{3}$

21. [Coordinate Geometry]
Graph the line of equation $y = 2x - 3$ by first completing this table of values.
[Label the line with the rule.]

x	–2	–1	0	1	2
y	–7	–5	–3	–1	1



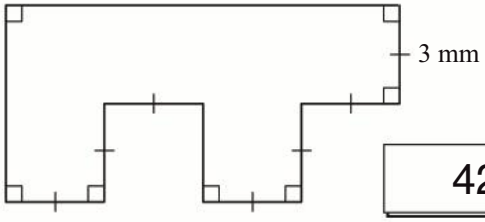
22. [Units of Measurement / Time]

Which metric prefix is used to describe one thousandth of a standard unit?

milli

23. [Perimeter / Area]

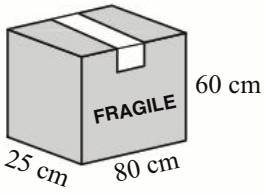
Find the perimeter of the polygon.



42 mm

24. [Surface Area]

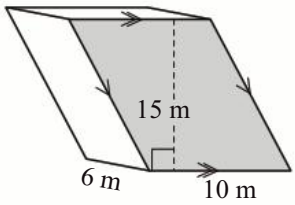
What is the total surface area of the cardboard box?



16 600 cm^2

25. [Volume]

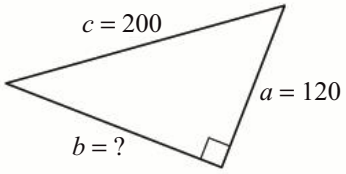
Find the volume of the prism using $V = Bh$.



900 m^3

26. [Pythagoras / Trigonometry]

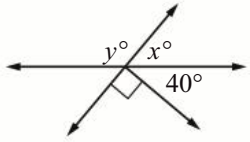
For this triangle use Pythagoras' theorem $a^2 + b^2 = c^2$. Find the length of the side labelled b.



160

27. [Angles]

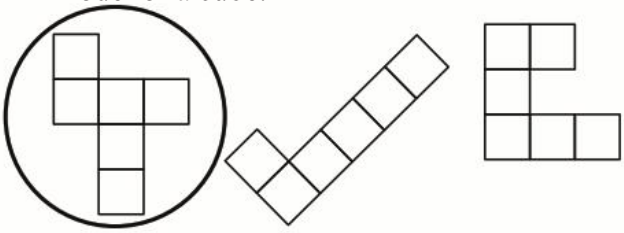
Find the values of $x°$ and $y°$.



$x° = 50°\ y° = 130°$

28. [Geometric Reasoning]

Circle the net that **can** be folded to make a model of a cube.



29. [Statistics]

Which set of data has the same mean, median and mode?

A) 6, 7, 8, 8, 11
B) 5, 5, 8, 11, 11

A

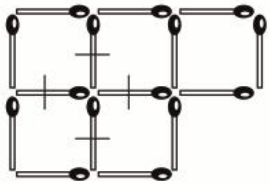
30. [Probability]

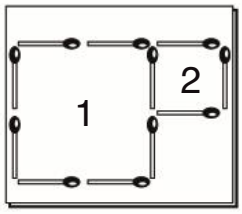
A dart board has 20 numbered sections of identical size. A dart is thrown and hits the board. What is the probability that the dart lands inside a section with a number less than 12? [Give the answer as a fraction in simplest form.]

$\frac{11}{20}$

31. [Problem Solving 1]

Which four matches should you remove to leave exactly two squares?





32. [Problem Solving 2]

Place all the digits 1 to 5 in each row and column, so that they are not repeated in any of the rows, columns, diagonals and shaded squares. The numbers outside the big square represent the products of the four digits in each shaded square.

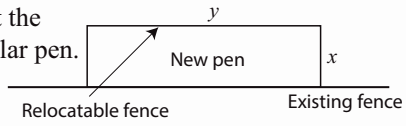
30 40

1	5	3	2	4
3	2	4	1	5
4	1	5	3	2
5	3	2	4	1
2	4	1	5	3

120 60

1.1

31. **Hint:** *Determine what is the best way to use the existing fence. Use trial and error.*
Solution:
Let x and y represent the sides of the rectangular pen.



To best use the existing fence $y \geq x$.
We need to find the largest possible value of $x \times y$ knowing $2x + y = 36$

Trial	x	y	$2x + y$	Area $x \times y$
1	12	12	36	144
2	11	14	36	154
3	10	16	36	160
4	9	18	36	**162**
5	8	20	36	160
6	7	22	36	154
7	6	24	36	144

So the largest possible area of the pen is **162** m^2.

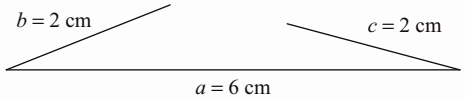
32. **Hint:** *Compare the number of single digit to double digit answers. What happens when you multiply by 1? Work on the lines with distinctive features.*
Solution:
We know that H must be 1 because C × H = C.
C × C = FH or F1. The only two-digit perfect square that ends in a 1 is 81.
So C = 9 and the table represents the **9**× multiplication table.

1.2

31. **Hint:** *List all the different triplets of whole numbers {a,b,c} that add to 10. Establish the rule:*

RULE: In any triangle with side lengths a, b, c, any one side must always be smaller than the sum of the other two sides.
$a < b + c$, $b < c + a$ and $c < a + b$ must all be true.

***e.g.** A triangle with side lengths of 2, 2, 6 results in $a < b + c$ being false, so it is an impossible triangle.*



Solution: The different triplets of whole numbers that add to 10 are: ~~{1,1,8}~~ ~~{2,2,6}~~ {3,3,4}
~~{1,2,7}~~ ~~{2,3,5}~~
~~{1,3,6}~~ {2,4,4}
~~{1,4,5}~~

Using the rule, impossible triangles have been eliminated.
The only possible triangles are
{2,4,4}, and {3,3,4}. Using 10 matchsticks,
2 different triangles can be formed.

32. **Hint:** *Try to find the numbers where you have the most information. Use trial and error.*
Solution: Consider the general form of the multiplication, where A to H can be any digit from 0 to 9.
5 + 0 = H, so **H = 5**
4 × 5 = 20, so **F = 0** with 2 carried over
G = 1
4 × B + 2 ends in 6, so **B = 1**
D + 6 = 7, so **D = 1**
E = 4
4 × A = 4, so **A = 1**
That leads to **C = 1**

A	B	5	
×	4	C	
	D	1	5
E	6^2	F	0
4	7	G	H

1	1	5	
×	4	1	
	1	1	5
4	6^2	0	0
4	7	1	5

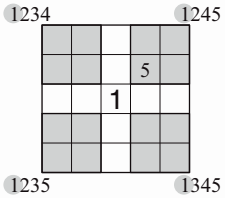
1.3

31. **Hint:** *Start by calculating the denominator.*
Solution:

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

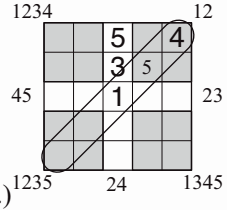
$$\therefore \quad \frac{5}{1+\frac{1}{1+3}} = \frac{5}{\frac{5}{4}} = \cancel{5} \times \frac{4}{\cancel{5}} = \mathbf{4}$$

32. **Hint:** *Find the 4 digits whose sums are listed in the corners. After filling in everything you can deduce from these sums, work the central cross.*
Solution: The sums must be:
1 + 2 + 3 + 4 = 10
1 + 2 + 4 + 5 = 12
1 + 2 + 3 + 5 = 11
1 + 3 + 4 + 5 = 13
We can also deduce that because 1 is in every shaded square the 1 in the central cross must be in the central position.



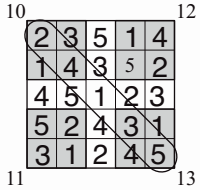
In the top two shaded squares there is only one 3 and one 5 so they must also be located in the top of the central cross as shown.

Looking at the marked diagonal the top right corner must be 4, as it can't be anywhere else on this diagonal. (No 4 in bottom left shaded square.)



Looking at this next diagonal, the bottom right corner must be 5, as it can't be anywhere else on that diagonal. (No 5 is in the top left shaded square.) The remaining 5's can be filled in and then the 1's.

Continue working systematically and place the numbers as shown.



1.4

31. **Hint:** *How many goals did Spanner kick for the season?*
Solution:

No. of matches × Average goals scored = Total no. of goals

At the end of the 4th match the average number of goals was 7.
So the total number of goals scored by the end of the 4th match was $4 \times 7 = 28$
At the end of the 5th match the average number of goals was 8.
So the total number of goals scored by the end of the 5th match was $5 \times 8 = 40$.
Taking the 4th match total from the 5th match total gives $40 - 28 = 12$
Spanner kicked **12** goals in the 5th match.

32. **Hint:** *First find the rate at which they each work. Use Algebra.*
Solution:
Let x = the number of books Mary arranges per day
So $\frac{4x}{7}$ = the number of books Rod arranges per day
Together:
Mary × 10 days + Rod × 15 days = 1300 books

$$10x + \frac{4x \times 15}{7} = 1300$$

$$10x + \frac{60x}{7} = 1300$$

$$70x + 60x = 1300 \times 7$$

$$130x = 1300 \times 7$$

$$x = 10 \times 7$$

$$x = 70$$

So the number of books Mary arranges per day is 70.
Given she works for 10 days then
$70 \times 10 = 700$
Mary arranges **700** books altogether.

1.5

31. **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:

×	5	8	6	7
5	25	40	30	35
2	10	16	12	14
9	45	72	54	63
7	35	56	42	49

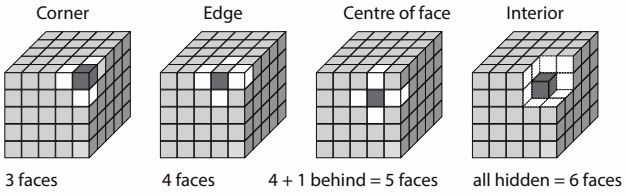
32. **Hint:** *Start with what you know and proceed step by step. A table format may help.*
Solution:

trees	bananas/tree	bananas
80	450	36 000
81	445	36 045
82	440	36 080
83	435	36 105
84	430	36 120
85	425	36 125
86	420	36 120
87	415	36 105

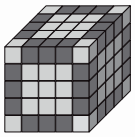
The maximum number of bananas that the farmer can produce on his plantation is **36 125** on **85** trees.

1.6

31. **Hint:** *Consider the different positions of the smaller cubes within the larger cube, and count the number of touching faces for a cube in these positions.*
Solution: The larger cube has smaller cubes in 4 different positions relative to number of faces that touch other cubes.
The number of faces that touch other cubes are shown below.

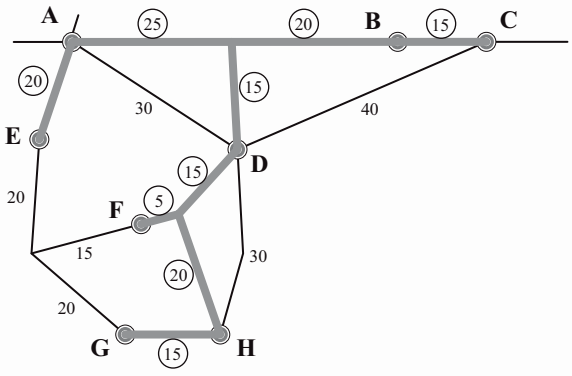


The edge cubes touch 4 other faces.



So **36** small cubes touch the faces of exactly 4 other cubes.

32. **Hint:** *You can start at any point. Try to find the shortest path to connect two neighbouring towns. Progress step by step, comparing the paths. Use trial and error.*
Solution:



10. [Rates / Ratios]

Skill 10.1 Finding the unit rate and the unit price.

To find the unit rate
- Divide the two quantities to show how many of the first quantity correspond to one of the second quantity.

To find the unit price
- Divide the total amount by the number of items.

Q. 200 litres flow in 5 minutes =

[ ] litres per minute

A. *200 litres in 5 minutes* Simplify the fraction by 5.

$= \frac{200\ L}{5\ min}$

$= \frac{200}{5}\ \frac{L}{min}$

$=$ ***40*** *litres per minute (L/min)*

a) 300 cars sold in 30 days =

[ ] cars per day

300 cars in 30 days

$= \frac{300\ cars}{30\ days}$ Simplify: ÷ 30

$=$ *10 cars per day*

b) 420 m walked in 5 minutes =

[ ] m per minute

420 m in 5 minutes

=

=

c) 12°C drop in 6 hours =

[ ] °C per hour

=

=

d) 600 beats in 10 minutes =

[ ] beats per minute

=

=

e) If 8 kg of apples are sold for $10, what is the cost per kilogram?

= [$ /kg]

f) The plumber charged $231 for a 3-hour job. What was the charge per hour?

= [/h]

g) Nina earns $100 for an 8-hour shift. How much does she earn per hour?

= [/h]

h) A 6-pack of exercise books cost $9.60. What is the price per exercise book?

= [$]

Skill 10.2 Simplifying ratios.

- Write the quantities of the ratio with the same unit of measurement.

EITHER

- Find the largest number that divides evenly into each quantity of the ratio (Highest Common Factor).
- Divide each quantity by the HCF.

Hints: The order of the quantities in a ratio matters.
':' means 'to'.

Examples: The ratio of legs to ears in a dog is 4 : 2 = 2 : 1
The ratio of ears to legs in a dog is 2 : 4 = 1 : 2

OR

- Divide each quantity of the ratio by any factor until the ratio is reduced to its simplest form.

$a : b = \frac{a}{b}$ (Ratio)

Q. Simplify 80 min : 3 h

A. $3\ h = 3 \times 60\ min = 180\ min$ (1 h = 60 min)

$80\ min : 3\ h$

$= {}^{4}\cancel{80}\ min : {}^{9}\cancel{180}\ min$ (HCF of 80 and 180 is 20 so ÷ 20)

$= 4 : 9$ (Ignore the units)

OR

A. $3\ h = 3 \times 60\ min = 180\ min$

$80\ min : 3\ h$

$= 8\emptyset\ min : 18\emptyset\ min$

$= {}^{4}\cancel{8} : {}^{9}\cancel{18}$ (Simplify: ÷ 10)

$= 4 : 9$ (Simplify: ÷ 2)

a) Simplify 600 mL : 0.2 L (1 L = 1000 mL; 3 zeros, 3 places right)

$0.2\ L = 0.200 \times 1000\ mL = 200\ mL$

$6\emptyset\emptyset\ mL : 2\emptyset\emptyset\ mL$ (Simplify: ÷ 100)

$= {}^{3}\cancel{6} : {}^{1}\cancel{2}$ (Simplify: ÷ 2) = 3 : 1

b) Simplify 2 m : 50 cm

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= ..... = ☐

c) Simplify 750 g : 1 kg

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= ..... = ☐

d) Simplify 6 months : 4 years

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= ..... = ☐

e) Simplify 2 km : 3200 m

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= ..... = ☐

f) Simplify \$24 : 300¢

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= ..... = ☐

g) Simplify 0.5 kg : 2000 g : 4 kg

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= ..... = ☐

h) Simplify 50¢ : \$4.00 : \$2.50

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= ..... = ☐

Skill 20.6 Solving equations involving algebraic fractions (1).

- Use inverse operations rules to isolate any algebraic fractions.
- Rewrite all expressions as fractions if necessary.
- Cross multiply. (see skill 10.11, page 109)
- Combine all variables on one side of the equation by using inverse operations. (see skill 20.5, page 211)
- To isolate the variable (x) perform the inverse operations, in order, to both sides of the equation.

Q. Solve for x: $\frac{x}{3} = x + 4$

A.

$$\frac{x}{3} = x + 4$$

$$\frac{x}{3} \times \frac{x+4}{1}$$ Cross multiply

$$x = 3(x + 4)$$

$$x = 3x + 12$$

$$x - 3x = 3x - 3x + 12$$ Combine x's: −3x

$$-2x = 12$$

$$\frac{-2x}{-2} = \frac{12}{-2}$$ Inverse of × −2 is ÷ −2

$$x = \mathbf{-6}$$

a) Solve for x: $\frac{x}{4} - 10 = -x$

Isolate the fraction

$\frac{x}{4} - 10 + 10 = -x + 10$

$\frac{x}{4} \times \frac{-x+10}{1}$ Rewrite expression as fraction

$x = 4(-x + 10)$

$x + 4x = -4x + 4x + 40$

$5x = 40$

$x =$ ☐

b) Solve for x: $\frac{18}{x} = 2$

$=$

$=$

$=$

$x =$ ☐

c) Solve for x:

$= \frac{6}{x} = \frac{3}{10}$

$=$

$=$

$=$

$x =$ ☐

d) Solve for x: $\frac{10}{x} = 5$

$=$

$=$

$=$

$=$

$x =$ ☐

e) Solve for x: $\frac{12}{x} = 3$

$=$

$=$

$=$

$=$

$x =$ ☐

f) Solve for x: $\frac{4}{x} = \frac{2}{7}$

$=$

$=$

$=$

$=$

$x =$ ☐

Skill 20.6 Solving equations involving algebraic fractions (2).

g) Solve for x: $\frac{20-2x}{3}=2$

$=$ .....

$=$ .....

$=$ .....

$=$ .....

$x=$ .....

h) Solve for x: $\frac{3x-2}{5}=8$

$=$ .....

$=$ .....

$=$ .....

$=$ .....

$x=$ .....

i) Solve for x: $\frac{5x-1}{3}=3$

$=$ .....

$=$ .....

$=$ .....

$=$ .....

$x=$ .....

j) Solve for x: $\frac{2x}{5}=x-3$

$=$ .....

$=$ .....

$=$ .....

$=$ .....

$x=$ .....

k) Solve for x: $8-x=\frac{2x}{5}$

$=$ .....

$=$ .....

$=$ .....

$=$ .....

$x=$ .....

l) Solve for x: $\frac{2x}{3}+10=4x$

$=$ .....

$=$ .....

$=$ .....

$=$ .....

$x=$ .....

m) Solve for x: $\frac{x-2}{4}=\frac{x+6}{5}$

$=$ .....

$=$ .....

$=$ .....

$=$ .....

$x=$ .....

n) Solve for x: $\frac{x+4}{3}=\frac{10-x}{4}$

$=$ .....

$=$ .....

$=$ .....

$=$ .....

$x=$ .....

o) Solve for x: $\frac{x+3}{3}-\frac{x-2}{5}=3$

$=$ .....

$=$ .....

$=$ .....

$=$ .....

$x=$ .....