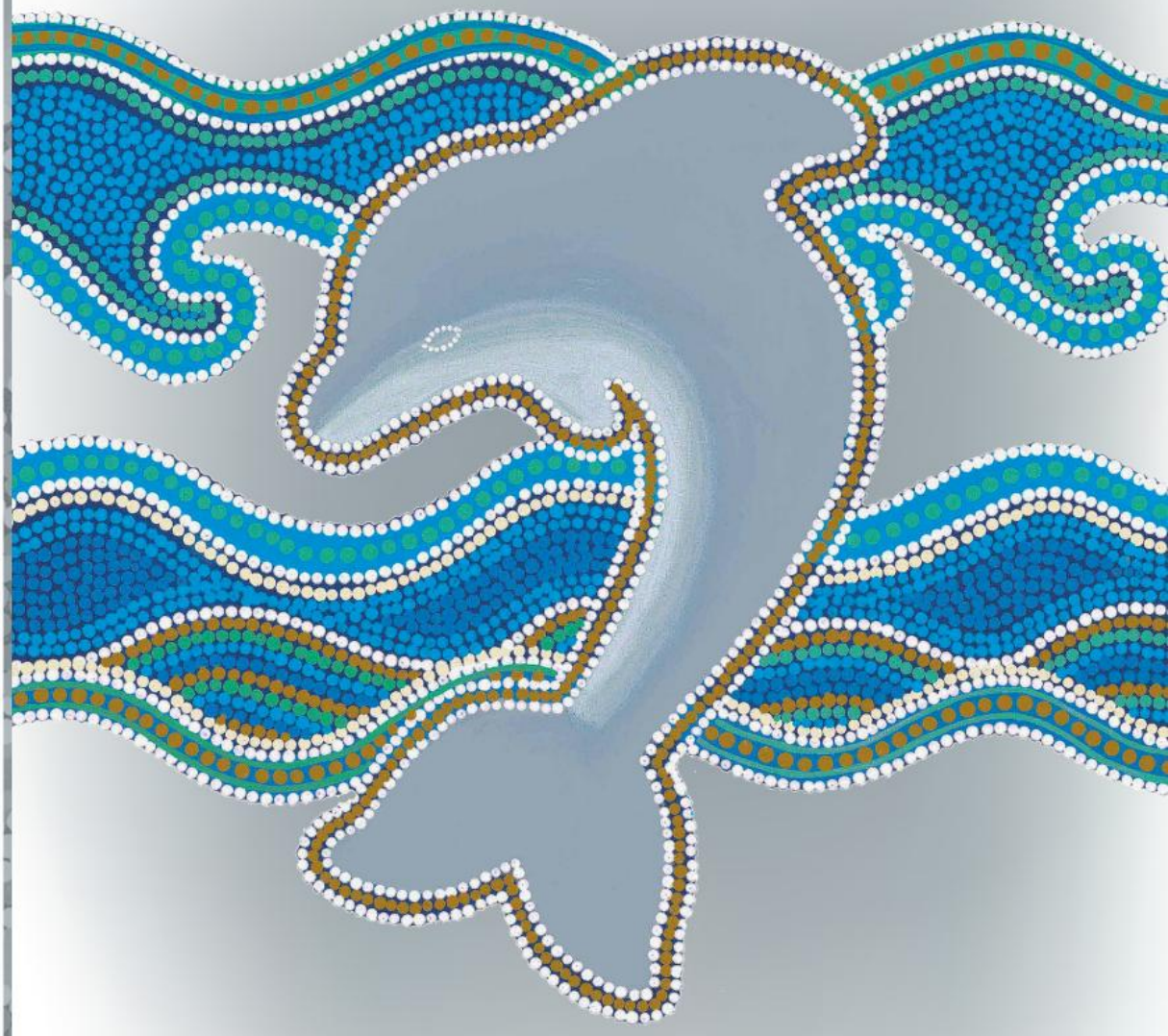
third edition

MATHS MATE

SILVER



J. B. Wright & I. Tutos

MATHS MATE

Student Workbook - 3rd Edition

ISBN 978 1 921535 69 7

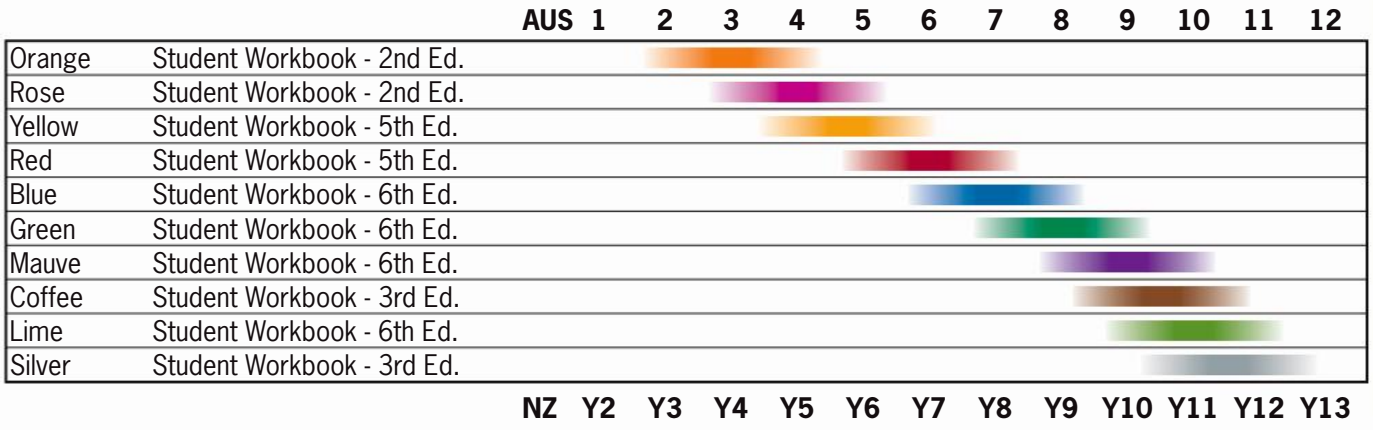
J. B. Wright & I. Tutos

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



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Maths Mate Silver cover painting

Dolphin - 2003
Acrylic on canvas 45 × 60 cm
by Australian artist Susan Betts - Kokata, Mirning and Wirangu.

'Dolphin' 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.

MATHS MATE

Name: .....

Class: .....

Teacher: .....

Worksheet Results

Term 1

		Sheet 1	Sheet 2	Sheet 3	Sheet 4	Sheet 5	Sheet 6	Sheet 7	Sheet 8
NUMBER & ALGEBRA	1. [Long ×,÷]	1	1	1	1	1	1	1	1
	2. [Decimal +,–]	2	2	2	2	2	2	2	2
	3. [Decimal ×,÷]	3	3	3	3	3	3	3	3
	4. [Fraction +,–]	4	4	4	4	4	4	4	4
	5. [Fraction ×,÷]	5	5	5	5	5	5	5	5
	6. [Percentages]	6	6	6	6	6	6	6	6
	7. [Integer +,–]	7	7	7	7	7	7	7	7
	8. [Integer ×,÷]	8	8	8	8	8	8	8	8
	9. [Rates / Ratios]	9	9	9	9	9	9	9	9
	10. [Indices]	10	10	10	10	10	10	10	10
	11. [Square Roots / Surds]	11	11	11	11	11	11	11	11
	12. [Order of Operations]	12	12	12	12	12	12	12	12
	13. [Exploring Number]	13	13	13	13	13	13	13	13
	14. [Scientific Notation]	14	14	14	14	14	14	14	14
	15. [Number Patterns]	15	15	15	15	15	15	15	15
	16. [Expressions]	16	16	16	16	16	16	16	16
	17. [Substitution]	17	17	17	17	17	17	17	17
	18. [Expansion]	18	18	18	18	18	18	18	18
	19. [Factorisation]	19	19	19	19	19	19	19	19
	20. [Equations]	20	20	20	20	20	20	20	20
	21. [Graphs & Functions]	21	21	21	21	21	21	21	21
MEASUREMENT & GEOMETRY	22. [Units of Measurement / Time]	22	22	22	22	22	22	22	22
	23. [Perimeter]	23	23	23	23	23	23	23	23
	24. [Area]	24	24	24	24	24	24	24	24
	25. [Volume]	25	25	25	25	25	25	25	25
	26. [Surface Area]	26	26	26	26	26	26	26	26
	27. [Pythagoras / Trigonometry]	27	27	27	27	27	27	27	27
	28. [Shape / Location]	28	28	28	28	28	28	28	28
	29. [Angles]	29	29	29	29	29	29	29	29
STATISTICS & PROBABILITY	30. [Statistics]	30	30	30	30	30	30	30	30
	31. [Probability]	31	31	31	31	31	31	31	31
PROBLEM SOLVING	32. [Problem Solving 1]	32	32	32	32	32	32	32	32
	33. [Problem Solving 2]	33	33	33	33	33	33	33	33
	Total Correct								

MATHS MATE

Term 1 - Sheet 1

Name: .....

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

Parent's Signature: .....

1. [Long ×,÷] *

$304 \times 14 =$

2. [Decimal +,–] *

$4.8 - 0.95 + 0.18 =$

3. [Decimal ×,÷]

$0.2 \times 0.3 =$

4. [Fraction +,–]

$\frac{x}{5} + \frac{2x}{5} =$

5. [Fraction ×,÷] *

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

6. [Percentages] *

Increase \$6 by 2.5%

\$

7. [Integer +,–]

$(+6) - (+8) + (-2) =$

8. [Integer ×,÷]

$(-5) \times (+12) =$

9. [Rates / Ratios] *

Share 475 pens in the ratio 10 : 7 : 8

: :

10. [Indices] *

Evaluate $\left(\frac{2}{3}\right)^{-2}$

11. [Square Roots / Surds]

Simplify $4\sqrt{7} \times 3\sqrt{2}$

12. [Order of Operations] *

$13 - 5 \times 3 =$

13. [Exploring Number] *

You buy 5 CDs at \$28.90 each and pay using the appropriate number of \$20 notes. How much change should you receive?

\$

14. [Scientific Notation]

How many significant figures are there in 205?

15. [Number Patterns]

Complete the pattern:

$\frac{10}{9}, \frac{10}{3}, 10, 30,$ ____ , ____

16. [Expressions]

Write the following as an algebraic expression:

The sum of p, q and w

17. [Substitution] *

The formula of the area of a triangle is $A = \frac{bh}{2}$. Find A when $b = 15$ and $h = 3$

18. [Expansion]

Expand $2xy(2x - y)$

19. [Factorisation] *

Factorise and simplify

$\frac{3xy - 6y}{3xy}$

20. [Equations] *

Solve for x:

$-3(4 - x) = 6$

21. [Graphs & Functions]

Complete the table:

rule	gradient (m)	x-intercept	y-intercept (c)
$y = 3x$			
$y = 3x - 6$			

22. [Units of Measurement / Time]

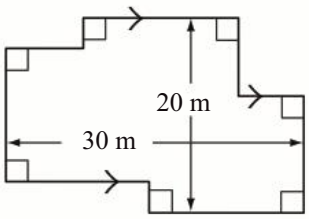
The Wills family departs Melbourne on March 27th at 1300 hours and arrives in London on March 28th at 0555 hours. How long was their journey, given London time is 10 hours behind Melbourne time?

h min

QUOTE OF THE WEEK: I went into McDonalds yesterday and said, "I'd like some fries." The girl at the counter said, "Would you like some fries with that?"

23. [Perimeter] *

Find the perimeter of the shape.



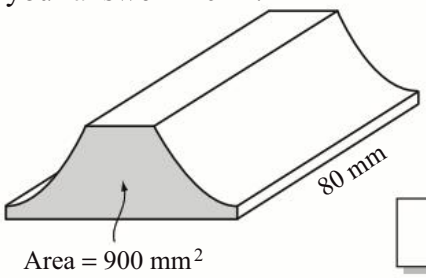
m

24. [Area] *

A rectangular field has dimensions 500 metres by 300 metres. How many kilograms of fertiliser are needed for this field if it is to be applied at the rate of 60 kilograms per hectare? [1 ha = 10 000 m^2]

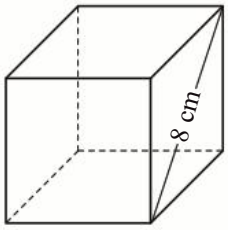
25. [Volume] *

Find the volume of the solid and express your answer in cm^3.



26. [Surface Area] *

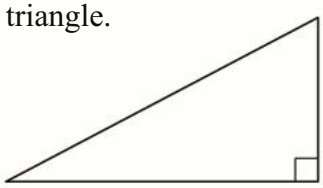
Find the total surface area of the cube.



cm^2

27. [Pythagoras / Trigonometry] *

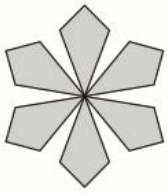
Find the length of the hypotenuse of this triangle.



m

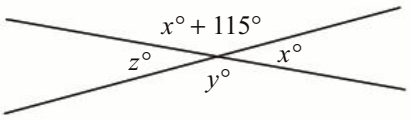
28. [Shape / Location]

What is the order of rotational symmetry of this shape? That is, in rotating the shape through 360°, how often will it look exactly as it did at the start? [Hint: A square has an order of 4.]



29. [Angles] *

Find the values of $x°$, $y°$ and $z°$.



$x° =$ $y° =$ $z° =$

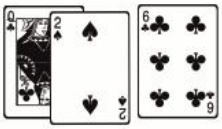
30. [Statistics] *

Find the mean of the following distribution.

Score	70	71	72	73	74
Frequency	1	4	10	4	1

31. [Probability] *

A 52 card deck of playing cards is shuffled, and three cards are dealt from the top of the deck. The first two cards are both black. Determine the probability of the third card also being black.



32. [Problem Solving 1] *

In your drawer you have 6 white socks, 4 black socks, 8 red socks, 4 yellow socks and 2 green socks. There is a power failure and you reach into the drawer in the dark. How many socks must you take with you to ensure you have a pair of the same colour?

33. [Problem Solving 2] *

Solve for x:

$(x+1)+(x+2)+(x+3)+\ldots+(x+100)=15\,050$

MATHS MATE

Term 1 - Sheet 2

Name: .....

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

Parent's Signature: .....

1. [Long ×,÷] *

$134 \times 34 =$

2. [Decimal +,–] *

$3.11 - 0.33 + 0.77 =$

3. [Decimal ×,÷]

$9 \div 0.03 =$

4. [Fraction +,–]

$\frac{4y}{7} - \frac{y}{7} =$

5. [Fraction ×,÷] *

$2\frac{6}{7} \div 2 =$

6. [Percentages] *

Reduce \$400 by 0.75%

\$

7. [Integer +,–]

$(-1) - (+7) + (-8) =$

8. [Integer ×,÷]

$(+2) \times (-25) =$

9. [Rates / Ratios] *

Arrange 756 people into three groups in the ratio 8 : 6 : 7

: :

10. [Indices] *

Evaluate $\left(\frac{1}{4}\right)^{-3}$

11. [Square Roots / Surds]

Simplify $\frac{6\sqrt{6}}{2\sqrt{3}}$

12. [Order of Operations] *

$(2 - 8) \times 8 - 19 =$

13. [Exploring Number]

A phone bill of \$241.50 is divided equally between three students. How much does each student pay?

\$

14. [Scientific Notation]

How many significant figures are there in 0.0120?

15. [Number Patterns]

Complete the pattern:

$9, 3, 1, \frac{1}{3}$, ____ , ____

16. [Expressions]

Write the following as an algebraic expression:

A number that is k less than the sum of m and n

17. [Substitution] *

Interest is calculated using the formula $I = \frac{PRT}{100}$. Find I when $P = 3000$, $R = 6.5$ and $T = 2$

18. [Expansion]

Expand $5x(2xy - 3y)$

19. [Factorisation] *

Factorise and simplify

$\frac{8x^2 - 6x}{12x - 9}$

20. [Equations] *

Solve for x:

$3(x - 1) = 2(x + 4)$

21. [Graphs & Functions]

Complete the table:

rule	gradient (m)	x-intercept	y-intercept (c)
$y = -5x$			
$y = 5x$			

22. [Units of Measurement / Time]

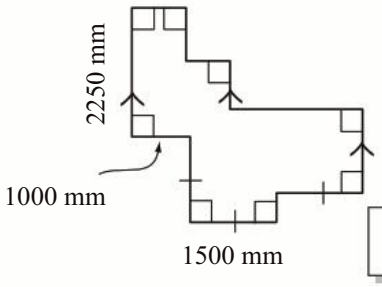
The Ming family departs London on April 19th at 2200 hours and arrives in Singapore on April 20th at 1715 hours. How long was their journey, given London time is 8 hours behind Singapore time?

h min

QUOTE OF THE WEEK: Everyone is kneaded out of the same bread but not baked in the same oven. Yiddish proverb

23. [Perimeter] *

Find the perimeter of the shape.



mm

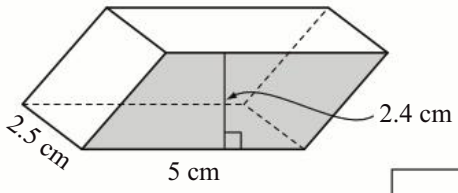
24. [Area] *

A rectangular swimming pool 15 m by 8 m has a 1 m wide concrete path around it. What is the area of the path?

m^2

25. [Volume] *

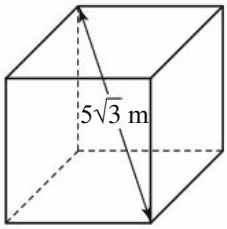
Find the volume of the prism.



cm^3

26. [Surface Area] *

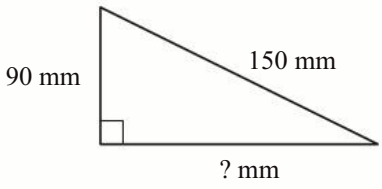
Find the total surface area of the cube.



m^2

27. [Pythagoras / Trigonometry] *

Find the missing side length of this triangle.



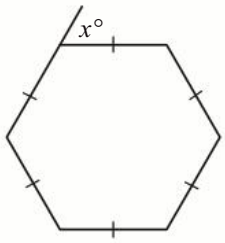
mm

28. [Shape / Location]

For the shape shown, find the minimum angle of rotation required to regain the original image.

29. [Angles] *

Find the value of $x°$.



30. [Statistics] *

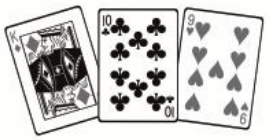
Find the mean of the following distribution.

Score	0	1	2	3	4
Frequency	10	8	6	4	2

31. [Probability] *

Three cards are drawn at random from a deck of 52. The probability of them all being red is: $\frac{26}{52}\times\frac{25}{51}\times\frac{24}{50}=\frac{2}{17}$

What is the probability that at least one card is black?



32. [Problem Solving 1] *

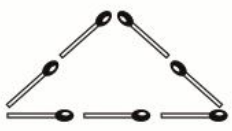
To the nearest whole second, what is one millionth of a year?

s

33. [Problem Solving 2] *

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 11 matchsticks?



{3,2,2}

{1,3,3}

MATHS MATE

Term 1 - Sheet 3

Name: .....

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

Parent's Signature: .....

1. [Long ×,÷] *

$62 \times 26 =$

2. [Decimal +,–] *

$2.41 - 0.72 + 1.43 =$

3. [Decimal ×,÷]

$0.04 \times 0.7 =$

4. [Fraction +,–] *

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

5. [Fraction ×,÷] *

$9\frac{3}{5} \div 3 =$

6. [Percentages] *

Reduce \$1000 by 0.15%

\$

7. [Integer +,–]

$(+9) + (-1) + (-2) =$

8. [Integer ×,÷]

$(-16) \div (-2) =$

9. [Rates / Ratios] *

Divide \$216 in the ratio 3 : 4 : 5

\$: \$: \$

10. [Indices] *

Evaluate $\frac{(-2)^8}{(-2)^6}$

11. [Square Roots / Surds]

Simplify $\frac{8\sqrt{12}}{6\sqrt{4}}$

12. [Order of Operations] *

$12 + 10 - 8 \times 4 =$

13. [Exploring Number]

Six kitchen chairs cost \$592.50. What is the cost per chair?

\$

14. [Scientific Notation]

How many significant figures are there in 63 000?

15. [Number Patterns]

Complete the pattern:

$\frac{3}{16}, \frac{3}{4}, 3, 12,$ ___ , ___

16. [Expressions]

Write the following as an algebraic expression:

Fifteen lots of g

17. [Substitution] *

The volume of a cube is found by using the formula $V = l^3$. Find V when $l = 0.4$ m.

m^3

18. [Expansion]

Expand

$5x(x^2 - 3x + 2)$

19. [Factorisation] *

Factorise and simplify

$\frac{6x^2 + 15x}{6x^2}$

20. [Equations] *

Solve for x:

$5(x + 1) = -20$

21. [Graphs & Functions]

Complete the table:

rule	gradient (m)	x-intercept	y-intercept (c)
$y = \frac{1}{2}x + 2$			
$y = \frac{1}{2}x + 3$			

22. [Units of Measurement / Time]

What is the arrival date and time in New York for the trip shown, given that New York time is 15 hours behind Melbourne time?

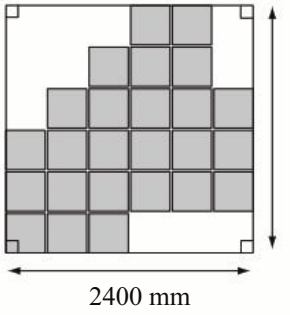
Flights Out: Melbourne to New York - Saturday 06 Feb 2010

From		To		Flight	Duration
15:30	Melbourne	__:__	New York	QF508	21h 40m

QUOTE OF THE WEEK: It is better in prayer to have a heart without words than words without a heart. Mahatma Gandhi

23. [Perimeter] *

Find the perimeter of the shaded paved area.



mm

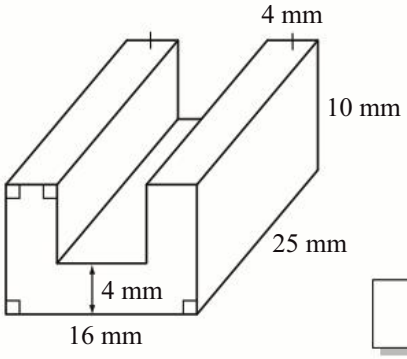
24. [Area] *

A rare type of coloured glass costs $600 per square metre. How much would a rectangular piece 20 cm by 25 cm cost?

$

25. [Volume] *

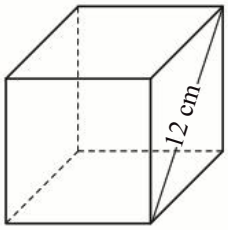
Find the volume of the solid.



mm^3

26. [Surface Area] *

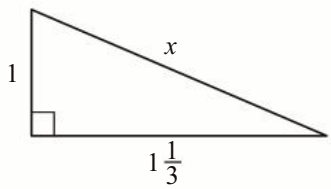
Find the total surface area of the cube.



cm^2

27. [Pythagoras / Trigonometry] *

Find the value of x.

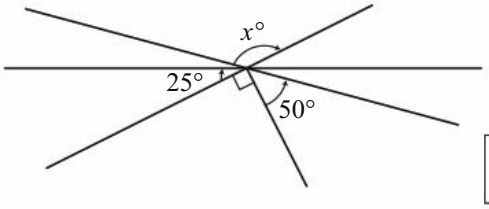


28. [Shape / Location]

What is the order of rotational symmetry of this shape? That is, in rotating the shape through 360°, how often will it look exactly as it did at the start? [Hint: A square has an order of 4.]

29. [Angles] *

Find the value of $x°$.



30. [Statistics] *

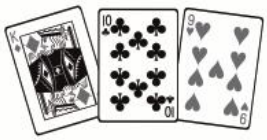
Find the mean of the following distribution.

Score	5	10	15	20	25	30
Frequency	7	5	4	2	1	1

31. [Probability] *

Two cards are drawn at random from a deck of 52. The probability that neither card is a heart is: $\frac{39}{52} \times \frac{38}{51} = \frac{19}{34}$

What is the probability that at least one card is a heart?



32. [Problem Solving 1] *

What two-digit whole number is twice the product of its digits?

33. [Problem Solving 2] *

If a and b are positive integers and $a + b + a \times b = 39$, what are the three possible values of $a + b$?

MATHS MATE

Term 1 - Sheet 4

Name: .....

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

Parent's Signature: .....

1. [Long ×,÷] *

$16.5 \div 11 =$

2. [Decimal +,–] *

$5.18 - 1.31 + 4.4 =$

3. [Decimal ×,÷]

$60 \div 0.3 =$

4. [Fraction +,–] *

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

5. [Fraction ×,÷] *

$4\frac{4}{5} \div 2 =$

6. [Percentages]

Increase \$100 000 by 0.025% $

7. [Integer +,–]

$(+3) - (-3) - (+3) =$

8. [Integer ×,÷]

$(+34) \div (-17) =$

9. [Rates / Ratios] *

Arrange 442 people into three groups in the ratio 8 : 5 : 4

: :

10. [Indices] *

Simplify $(x^0)^3$

11. [Square Roots / Surds]

Simplify $4\sqrt{3} \times 2\sqrt{5}$

12. [Order of Operations] *

$3 + 6 - 36 \div 2 =$

13. [Exploring Number] *

You buy tickets for 8 adults and 8 children. The tickets cost \$16.75 each and \$8.25 each respectively. How much change should you receive after handing over the appropriate number of \$50 notes?

$

14. [Scientific Notation]

How many significant figures are there in 0.004?

15. [Number Patterns]

Complete the pattern:

$12, 6, 3, \frac{3}{2}$, ___ , ___

16. [Expressions]

Write the following as an algebraic expression:

The average of s and t

17. [Substitution]

To calculate the sum of the angles of a polygon, use the formula $T = (n - 2) \times 180°$.

Find T for $n = 10$ (a decagon).

18. [Expansion]

Expand $4x(3x^2 + 5x)$

19. [Factorisation] *

Factorise and simplify

$$\frac{6ab - 2b^2}{12ab - 4b^2}$$

20. [Equations] *

Solve for x:

$2(4x + 1) = 3(3x + 2)$

21. [Graphs & Functions]

Complete the table:

rule	gradient (m)	x-intercept	y-intercept (c)
$y = -2x$			
$y = -2x + 2$			

22. [Units of Measurement / Time]

What is the arrival date and time in Singapore for the trip shown, given that Singapore time is 2 hours behind Sydney time?

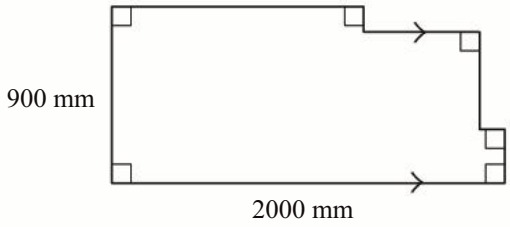
Flights Out: Sydney to Singapore - Saturday 13 Feb 2010

From		To		Flight	Duration
16:00	Sydney	__:__	Singapore	QF509	8h 15m

QUOTE OF THE WEEK: The Lord's prayer is 66 words, the Gettysburg Address is 286 words, there are 1322 words in the Declaration of Independence, but government regulations on the sale of cabbage total 26 911 words. U.S. National Review

23. [Perimeter] *

Find the perimeter of the shape.



mm

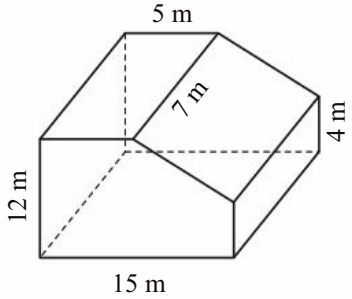
24. [Area] *

A certain type of tile costs $60 per square metre. If each tile is a square with sides of 25 cm, how much does one tile cost?

$

25. [Volume] *

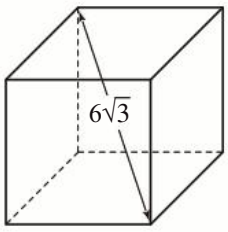
Find the volume of the prism.



m^3

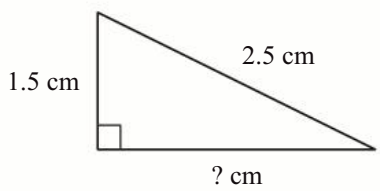
26. [Surface Area] *

Find the total surface area of the cube.



27. [Pythagoras / Trigonometry] *

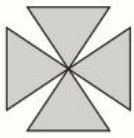
Find the missing side length of this triangle.



cm

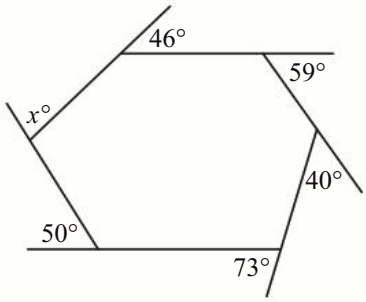
28. [Shape / Location]

For the shape shown, find the minimum angle of rotation required to regain the original image.



29. [Angles] *

Find the value of $x°$.



30. [Statistics] *

Find the mean of the following distribution.

Score	0	100	200	300	400
Frequency	5	10	15	20	50

31. [Probability] *

A card is drawn at random from a deck of 52. What is the probability of selecting a card numbered 2, 3, 4, 5, 6, 7, 8, 9 or 10?

32. [Problem Solving 1] *

If $x^a = 2$ and $x^b = 3$, find the value of $x^{(2a+3b)}$

33. [Problem Solving 2] *

A polygon has 4850 diagonals. How many sides does the polygon have?

MATHS MATE

Term 1 - Sheet 5

Name: .....

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

Parent's Signature: .....

1. [Long ×,÷]

$88 \times 13 =$

2. [Decimal +,–] *

$10 + 1.6 - 0.75 =$

3. [Decimal ×,÷] *

$0.3 \div 6 =$

4. [Fraction +,–] *

$1\frac{2}{7} + \frac{6}{21} =$

5. [Fraction ×,÷] *

$2 \times \frac{m}{6} =$

6. [Percentages] *

Calculate the simple interest Mrs Williams would need to pay if she borrowed $10 000 for five years at 9% per annum.

$

7. [Integer +,–] *

$8 - (6 - 9) =$

8. [Integer ×,÷]

$(+t) \times (-2) =$

9. [Rates / Ratios] *

A cyclist travels at 30 km/h. How far does she ride in 40 minutes?

km

10. [Indices]

Simplify $(-b^3)^4$

11. [Square Roots / Surds] *

Simplify $\sqrt{45}$

12. [Order of Operations] *

$(5 - 14) \div (5 - 2) =$

13. [Exploring Number]

Write $\frac{1}{40}$ as a decimal.

14. [Scientific Notation]

Express 9 160 000 km^2, the approximate area of USA, in scientific notation.

15. [Number Patterns]

Complete the pattern:

0, 2, 6, 14, ___ , ___

16. [Expressions]

Write the following as an algebraic expression:

2 more than a half of d

17. [Substitution] *

If $a = 4$ and $b = 5$, find the value of $3a - 5b$

18. [Expansion] *

Expand and simplify

$2(x + 3) + x(x + 3)$

19. [Factorisation] *

Factorise

$x^2 + ax + bx + ab$

20. [Equations] *

Solve for x:

$4(3x + 2) = 0$

21. [Graphs & Functions] *

Find the equation of the line joining the points P(–3,–3) and Q(–2,2), using the formula $y - y_1 = m(x - x_1)$ where $m = \frac{y_2 - y_1}{x_2 - x_1}$

$y =$

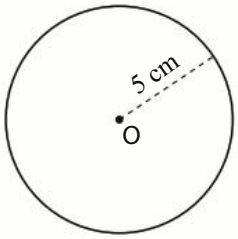
22. [Units of Measurement / Time]

How many centimetres in 2.4 km?

QUOTE OF THE WEEK: The most effective way to cope with change is to help create it. L. W. Lynett

23. [Perimeter] *

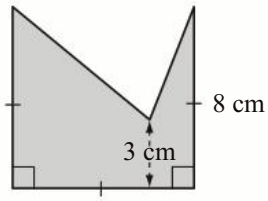
Find the circumference of the circle.
(Use $\pi \approx 3.14$)



cm

24. [Area] *

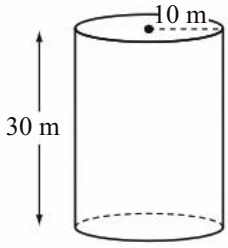
Find the area of the shape.



cm^2

25. [Volume] *

Find the volume of the cylinder.
(Use $\pi \approx 3.14$)



m^3

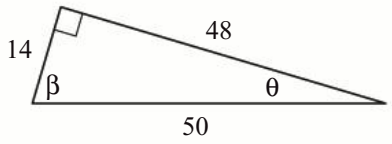
26. [Surface Area] *

Using $TSA = 2\pi r(r + h)$ where $\pi \approx 3.14$, find the total surface area of a cylindrical pellet of radius 1 cm and height 4 cm.

cm^2

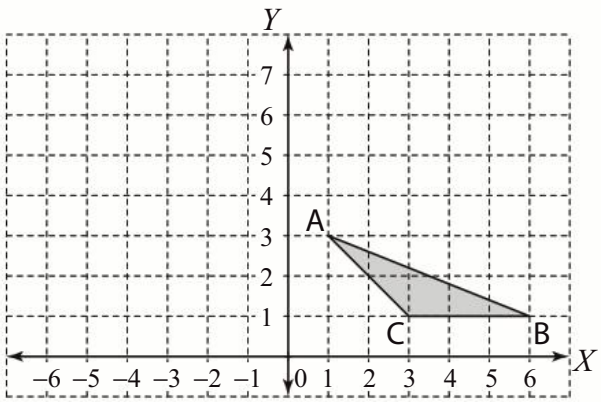
27. [Pythagoras / Trigonometry] *

For which angle is the cosine ratio 0.96?



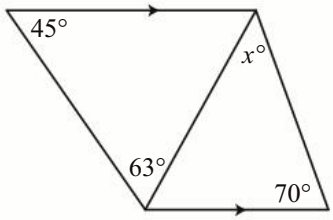
28. [Shape / Location]

Redraw the triangle ABC after translating it –5 units horizontally and 4 units vertically.



29. [Angles] *

Find the value of $x°$.



30. [Statistics]

During which decade did the U.S. federal minimum wage decrease the most in terms of 2007 dollars?

31. [Probability]

What is the probability that a person chosen at random voted for Julius in the school election? [Complete the two-way table.]

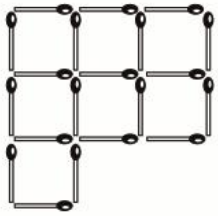
	Mai	Jane	Julius	Total
Yr 10 students	30	6		37
Yr 11 students			7	38
Yr 12 students	5		28	36
Total		37		

32. [Problem Solving 1] *

The apartment block has 88 apartments and 196 rooms altogether. Each apartment has either 2 or 3 rooms. How many apartments have 2 rooms?

33. [Problem Solving 2]

Move three matches to new positions so as to make exactly 5 squares, all the same size.



MATHS MATE

Term 1 - Sheet 6

Name: .....

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

Parent's Signature: .....

1. [Long ×,÷]

$1230 \div 6 =$

2. [Decimal +,–] *

$6.6 + 0.25 - 0.5 =$

3. [Decimal ×,÷]

$0.7 \times 60 =$

4. [Fraction +,–] *

$3\frac{1}{5} - \frac{31}{15} =$

5. [Fraction ×,÷] *

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

6. [Percentages] *

Sara invested $900 at 5% per annum simple interest for 18 months. How much interest would she earn in this period?

$

7. [Integer +,–] *

$-2 - (3 - 10) =$

8. [Integer ×,÷]

$(-6r) \div (-3) =$

9. [Rates / Ratios] *

A jet travels at 900 km/h. How far does it go in 10 seconds?

km

10. [Indices]

Simplify $-(e^7)^2$

11. [Square Roots / Surds] *

Simplify $\sqrt{200}$

12. [Order of Operations] *

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

13. [Exploring Number]

Write $\frac{26}{9}$ as a recurring decimal.

14. [Scientific Notation]

Express 4 500 000 000 years, the age of the Earth, in scientific notation.

years

15. [Number Patterns]

Complete the pattern:

2, 2, 4, 6, ___ , ___

16. [Expressions]

Write the following as an algebraic expression:

A number that is three less than the sum of k and z

17. [Substitution] *

If $d = 3$ and $e = -8$, find the value of $d(e - d)$

18. [Expansion] *

Expand and simplify

$x(x + 2) - (x + 2)$

19. [Factorisation] *

Factorise

$x^3 + x^2y + xy^2 + y^3$

20. [Equations] *

Solve for x:

$5(4x + 3) = 0$

21. [Graphs & Functions] *

Find the equation of the line joining the points A(4,–1) and B(2,0), using the formula $y - y_1 = m(x - x_1)$ where $m = \frac{y_2 - y_1}{x_2 - x_1}$

$y =$

22. [Units of Measurement / Time]

A fish tank has a volume of 0.8 m^3. What is its capacity in litres?

QUOTE OF THE WEEK: High School Sign: "Free, every Monday to Friday - Knowledge. Bring your own containers."

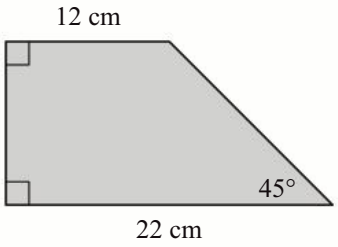
23. [Perimeter] *

A circle has a circumference of 44 cm.
Using $\pi \approx \frac{22}{7}$ find its diameter.

cm

24. [Area] *

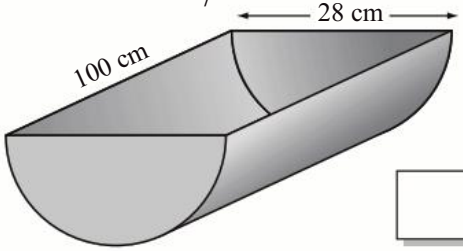
Find the area of the shape.



cm^2

25. [Volume] *

Find the capacity in litres of the animal feed bin. (Use $\pi \approx \frac{22}{7}$)



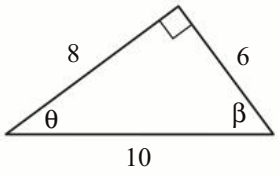
26. [Surface Area] *

Find the total surface area of a plank of wood that is in the shape of a rectangular prism and measures 10 cm by 200 cm by 4 cm.

cm^2

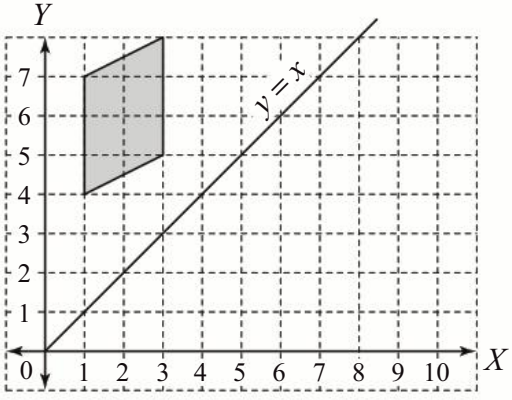
27. [Pythagoras / Trigonometry] *

For which angle is the sine ratio 0.8?



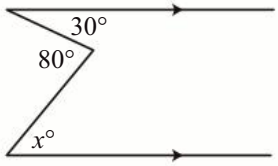
28. [Shape / Location]

Draw the reflection of the parallelogram in the line of equation $y = x$.



29. [Angles] *

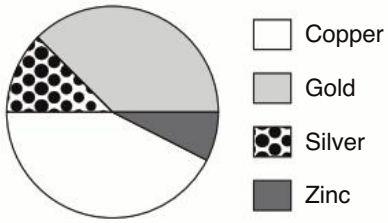
Find the value of $x°$.



30. [Statistics]

The actual gold content of 9-carat gold must be $\frac{9}{24}$ ths of the alloy. This pie chart gives an example of the proportion of other metals in the alloy. What fraction of the 9-carat gold is silver?

Typical Composition of 9-Carat Gold



31. [Probability]

What is the probability that a musician chosen at random from the orchestra plays a string instrument? [Complete the two-way table.]

	Men	Women	Total
String	10	12	
Woodwind		9	15
Brass	3		6
Total			

32. [Problem Solving 1] *

A small rectangular paddock is divided into four smaller rectangular yards as shown. The areas of three of the yards are given. What is the area of the fourth yard?

270 m^2	648 m^2
360 m^2	? m^2

m^2

33. [Problem Solving 2] *

A five metre long ladder rests at an angle against a vertical wall. The foot of the ladder is moved one metre further away from the base of the wall and in this movement the top of the ladder slides exactly one metre down the wall! What distance from the ground is the top of the ladder now?

m

MATHS MATE

Term 1 - Sheet 7

Name: .....

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

Parent's Signature: .....

1. [Long ×,÷]

$405 \div 5 =$

2. [Decimal +,–] *

$2 - 0.17 + 0.2 =$

3. [Decimal ×,÷]

$0.08 \div 0.2 =$

4. [Fraction +,–]

$\frac{2}{3} + \frac{7}{10} =$

5. [Fraction ×,÷]

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

6. [Percentages] *

Each year Alan pays back 8% of the total loan of $12 000. How much does he still owe after 10 years?

$

7. [Integer +,–] *

$8 + (4 - 11) =$

8. [Integer ×,÷]

$(+3m) \times (-3) =$

9. [Rates / Ratios] *

A motorcyclist travels at a speed of 72 km/h. How long would he take to travel 3.6 kilometres?

min

10. [Indices]

Simplify $(-2x^3)^3$

11. [Square Roots / Surds] *

Simplify $\sqrt{12x^3}$

12. [Order of Operations] *

$(8 + 3 - 11)^5 - 9 =$

13. [Exploring Number]

Write $\frac{1}{12}$ as a recurring decimal.

14. [Scientific Notation]

Express 12 500 in scientific notation correct to 2 significant figures.

15. [Number Patterns]

Complete the pattern:

3, 3, 6, 9, 15, ___ , ___

16. [Expressions]

Write the following as an algebraic expression:

Two more than five lots of b

17. [Substitution] *

If $x = 4$ and $y = -1$, find the value of $x^2 + xy$

18. [Expansion] *

Expand and simplify $x(x - 5) + 5(x - 5)$

19. [Factorisation] *

Factorise $2a^2b - 6ab - 3a + 9$

20. [Equations] *

Solve for x:

$\frac{1}{2}(x - 5) = 0$

21. [Graphs & Functions] *

Find the equation of the line joining the points M(0,–2) and N(–1,3), using the formula $y - y_1 = m(x - x_1)$ where $m = \frac{y_2 - y_1}{x_2 - x_1}$

$y =$

22. [Units of Measurement / Time]

The capacity of an eye dropper is 5 mL. Find its volume in mm^3.

QUOTE OF THE WEEK: Keep away from people who try to belittle your ambitions. Small people always do that, but the really great make you feel that you, too, can become great. Mark Twain

23. [Perimeter] *

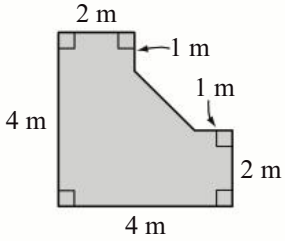
The wheels of a radio-controlled car have a radius of 3.5 cm. If the wheels are rotating 25 times every second, what is the speed of the model car in metres per second?

(Use $\pi \approx \frac{22}{7}$)

m/s

24. [Area] *

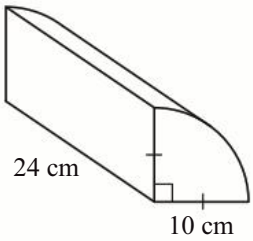
Find the area of the shape.



m^2

25. [Volume] *

Using $\pi \approx 3.14$ find the volume of the solid.



cm^3

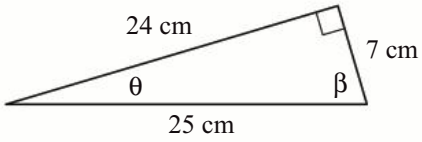
26. [Surface Area] *

Using $TSA = \pi r(r + s)$ where $\pi \approx 3.14$, find the total surface area of a cone of radius 3.5 cm and slant height 16.5 cm.

cm^2

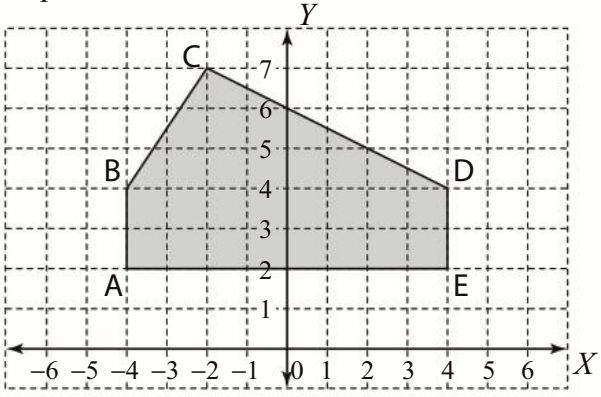
27. [Pythagoras / Trigonometry] *

For which angle is the sine ratio 0.28?



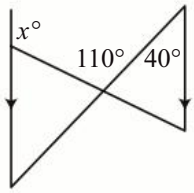
28. [Shape / Location]

Scale the shape ABCDE by a factor of a $\frac{1}{2}$ using the origin as the centre of enlargement or point of reference.



29. [Angles] *

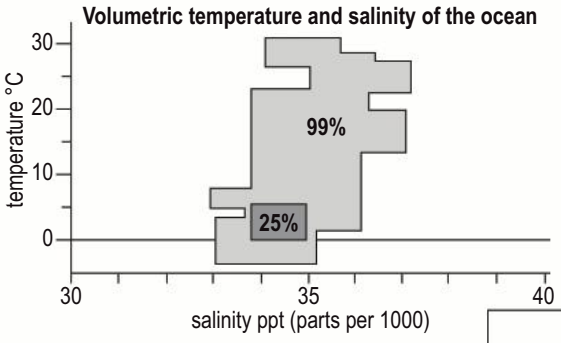
Find the value of $x°$.



30. [Statistics]

Which best describes the ocean?

A) 99% is between 33 and 36 salinity ppt
B) 99% is between 0 and 30°C
C) 25% is between 33 and 34 salinity ppt
D) 25% is between 0 and 6°C



31. [Probability]

What is the probability that a vehicle chosen at random was a Nissan 4×4? [Complete the two-way table.]

	Toyota	Nissan	Ford	Total
Vans	4	3		13
4×4	5			
Sedans		9	1	
Total	11	17	7	

32. [Problem Solving 1] *

If n is an even number, which of the following must also be even?

I. $n + n$ II. $n + n + n$ III. $n \times n \times n$

A) I only
B) II only
C) III only
D) II and III only
E) I, II and III

33. [Problem Solving 2] *

Water in the Murray River flows at 6 km/h. The paddlesteamer 'Pevensey' takes 4 hours to complete a 36 km round trip on the river (18 km down stream and 18 km back up stream). What is the boat's speed relative to the water?

km/h

MATHS MATE

Term 1 - Sheet 8

Name: .....

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

Parent's Signature: .....

1. [Long ×,÷]

$693 \div 7 =$

2. [Decimal +,–] *

$3.1 - 0.3 - 0.05 =$

3. [Decimal ×,÷] *

$0.4 \times 0.25 =$

4. [Fraction +,–] *

$\frac{7}{8} - \frac{1}{6} =$

5. [Fraction ×,÷] *

$\frac{1}{f} \div \frac{2}{f} =$

6. [Percentages] *

Each year Trevor pays any interest that has accrued on his loan, plus 5% of the original $100 000 loan. How much does he still owe after 6 years?

$

7. [Integer +,–] *

$-2 + (2 - 9) =$

8. [Integer ×,÷]

$(-21y) \div (-7) =$

9. [Rates / Ratios] *

The African wild dog can run at up to 45 km/h. At t his rate how long does it take it to cover 6 km?

min

10. [Indices] *

Simplify $3m^2 \times (2m^3)^2$

11. [Square Roots / Surds] *

Simplify $\sqrt{32t}$

12. [Order of Operations] *

$(125 \times 38 \div 9)^0 + 15 =$

13. [Exploring Number]

Write $\frac{15}{7}$ as a recurring decimal.

14. [Scientific Notation]

Express 0.00407 in scientific notation correct to 2 significant figures.

15. [Number Patterns]

Complete the pattern:

47, 48, 50, 53, ___ , ___

16. [Expressions]

Write the following as an algebraic expression:

One third of the sum of f and d

17. [Substitution] *

If $h = -6$ and $k = -2$, find the value of h^2k

18. [Expansion] *

Expand and simplify

$x(x + 4) - 4(x + 4)$

19. [Factorisation] *

Factorise

$5e + e^2 + 5f + ef$

20. [Equations] *

Solve for x:

$\frac{2}{3}(4x - 1) = 0$

21. [Graphs & Functions] *

Find the equation of the line joining the points F(–4,–2) and G(3,1), using the formula $y - y_1 = m(x - x_1)$ where $m = \frac{y_2 - y_1}{x_2 - x_1}$

$y =$

22. [Units of Measurement / Time]

Change 0.001 tonne into grams.

QUOTE OF THE WEEK: Only those who risk going too far can possibly find out how far one can go. T. S. Elliot

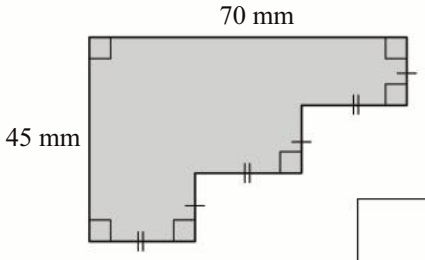
23. [Perimeter] *

French artist Jean-Auguste-Dominique Ingres painted '*The Turkish Bath*' in 1862. The painting has been completed on a circular canvas with a diameter of 1.1 m. Find the circumference of the painting. (Use $\pi \approx 3.14$)

m

24. [Area] *

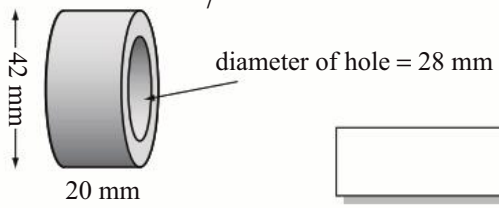
Find the area of the shape.



mm^2

25. [Volume] *

Find the volume of rubber used to make the tyre. (Use $\pi \approx \frac{22}{7}$)



mm^3

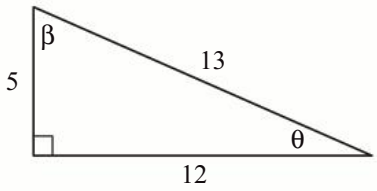
26. [Surface Area] *

Given $TSA = 4\pi r^2$ for a sphere, use $\pi \approx 3.14$ to find the total surface area of a solid hemisphere of diameter 20 cm.

cm^2

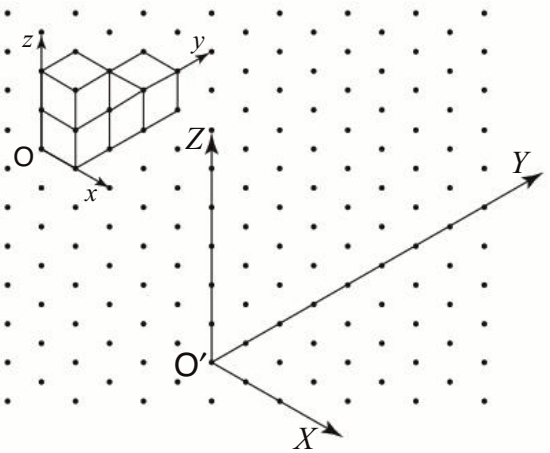
27. [Pythagoras / Trigonometry] *

For which angle is the tangent ratio 2.4?



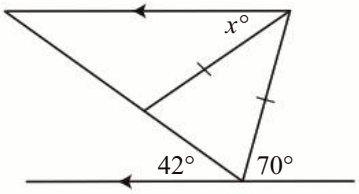
28. [Shape / Location]

Redraw the solid after it has been enlarged by a scale factor of 2.



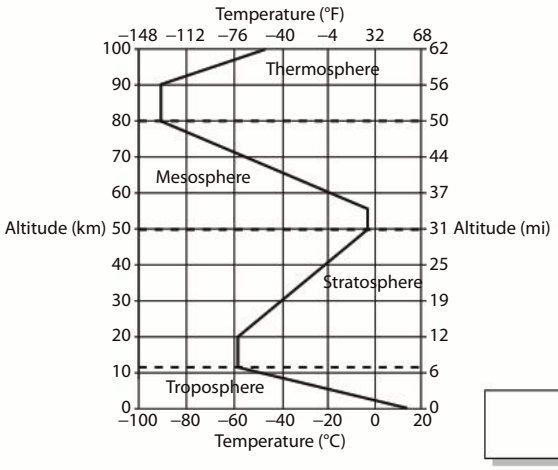
29. [Angles] *

Find the value of $x°$.



30. [Statistics]

What is the difference, to the nearest 10°C, between the minimum temperature reached in the stratosphere and the mesosphere?



31. [Probability]

What is the probability that a person chosen at random was aged 56 years or more and voted "No" in the referendum? [Complete the two-way table.]

	18 - 35 years	36 - 55 years	56 + years	Total
Yes		900		1400
No		400	400	
Total	400		600	

32. [Problem Solving 1] *

If p is the smallest of three consecutive integers p, q and r, what is the sum of q and r expressed in terms of p?

33. [Problem Solving 2] *

$$\sqrt{6+\sqrt{6+\sqrt{6+\sqrt{6+\sqrt{6+.....}}}}} = n$$

Find the value of n given that it is a positive whole number.

MATHS MATE

Name: .....

Class: .....

Teacher: .....

Worksheet Results

Term 2

		Sheet 1	Sheet 2	Sheet 3	Sheet 4	Sheet 5	Sheet 6	Sheet 7	Sheet 8
NUMBER & ALGEBRA	1. [Long ×,÷]	1	1	1	1	1	1	1	1
	2. [Decimal +,–]	2	2	2	2	2	2	2	2
	3. [Decimal ×,÷]	3	3	3	3	3	3	3	3
	4. [Fraction +,–]	4	4	4	4	4	4	4	4
	5. [Fraction ×,÷]	5	5	5	5	5	5	5	5
	6. [Percentages]	6	6	6	6	6	6	6	6
	7. [Integer +,–]	7	7	7	7	7	7	7	7
	8. [Integer ×,÷]	8	8	8	8	8	8	8	8
	9. [Rates / Ratios]	9	9	9	9	9	9	9	9
	10. [Indices]	10	10	10	10	10	10	10	10
	11. [Square Roots / Surds]	11	11	11	11	11	11	11	11
	12. [Order of Operations]	12	12	12	12	12	12	12	12
	13. [Exploring Number]	13	13	13	13	13	13	13	13
	14. [Scientific Notation]	14	14	14	14	14	14	14	14
	15. [Number Patterns]	15	15	15	15	15	15	15	15
	16. [Expressions]	16	16	16	16	16	16	16	16
	17. [Substitution]	17	17	17	17	17	17	17	17
	18. [Expansion]	18	18	18	18	18	18	18	18
	19. [Factorisation]	19	19	19	19	19	19	19	19
	20. [Equations]	20	20	20	20	20	20	20	20
	21. [Graphs & Functions]	21	21	21	21	21	21	21	21
MEASUREMENT & GEOMETRY	22. [Units of Measurement / Time]	22	22	22	22	22	22	22	22
	23. [Perimeter]	23	23	23	23	23	23	23	23
	24. [Area]	24	24	24	24	24	24	24	24
	25. [Volume]	25	25	25	25	25	25	25	25
	26. [Surface Area]	26	26	26	26	26	26	26	26
	27. [Pythagoras / Trigonometry]	27	27	27	27	27	27	27	27
	28. [Shape / Location]	28	28	28	28	28	28	28	28
	29. [Angles]	29	29	29	29	29	29	29	29
STATISTICS & PROBABILITY	30. [Statistics]	30	30	30	30	30	30	30	30
	31. [Probability]	31	31	31	31	31	31	31	31
PROBLEM SOLVING	32. [Problem Solving 1]	32	32	32	32	32	32	32	32
	33. [Problem Solving 2]	33	33	33	33	33	33	33	33
	Total Correct								

MATHS MATE

Term 2 - Sheet 1

Name: .....

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

Parent's Signature: .....

1. [Long ×,÷] *

$22 \times 66 =$

2. [Decimal +,–]

$1 - 0.043 =$

3. [Decimal ×,÷]

$2.4 \times 0.8 =$

4. [Fraction +,–] *

$\frac{x}{2} + \frac{x}{4} =$

5. [Fraction ×,÷] *

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

6. [Percentages] *

Jacob donates 8% of his income to charity. If he gives $12 per week to charity, how much does he earn?

$ /week

7. [Integer +,–] *

$-3 - (6 - 15) =$

8. [Integer ×,÷]

$(-3) \times (-5) \times (+4) =$

9. [Rates / Ratios] *

On a map the distance between Ballarat and Ararat is 15 cm. What is the scale factor if the actual distance is 90 km?

1 :

10. [Indices] *

Evaluate $(0.1)^{-3}$

11. [Square Roots / Surds] *

Between which two consecutive whole numbers does $2\sqrt{3}$ lie?

12. [Order of Operations] *

$(6 - 3) \times (3 - 6) =$

13. [Exploring Number] *

You need 5 m of cloth to make 2 jackets. How many jackets can be made from 150 m of cloth?

14. [Scientific Notation]

Which is the order of magnitude of 86 000?

[i.e. What power of 10 appears in the scientific notation of the number? OR What power of 10 is the number closest to?]

A) 10^3 B) 10^4

C) 10^5 D) 10^6

15. [Number Patterns]

Complete the pattern:

$1, 1\frac{3}{5}, 2\frac{1}{5}, 2\frac{4}{5},$ ___ , ___

16. [Expressions]

Add the following polynomials:

$(8x^2 - 6x - 9) + (9x^2 - 6x + 8)$

17. [Substitution] *

If $a = 5$, $b = 0$ and $x = 4$, simplify $b(a + x)$

18. [Expansion] *

Expand and simplify $2(x + 1)^2 - 4$

19. [Factorisation]

Factorise $4x^2 + 20x + 25$

20. [Equations] *

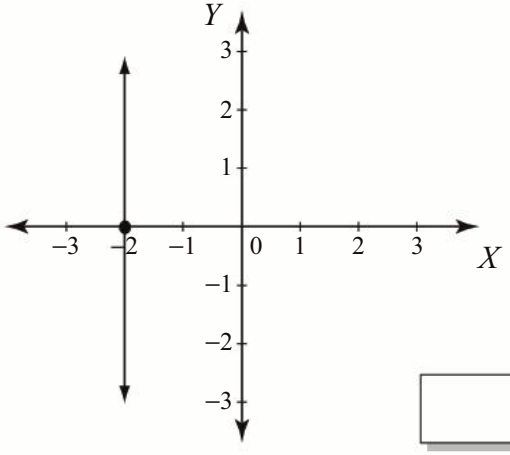
Solve the simultaneous equations:

$y = 2x + 1$

$y = x - 1$

21. [Graphs & Functions]

Find the equation of the line.



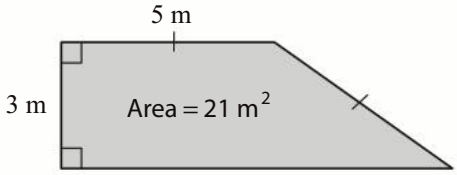
QUOTE OF THE WEEK: Caution: Cape does not enable user to fly. (Batman costume warning label.)

22. [Units of Measurement / Time]

How many square centimetres are there in 200 square millimetres?

23. [Perimeter] *

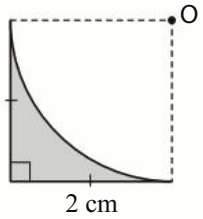
Find the perimeter of the trapezium.



m

24. [Area] *

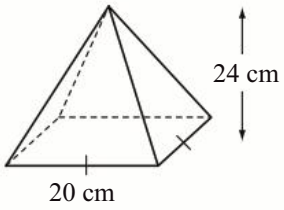
Using $\pi \approx 3.14$ find the area of the shaded region.



cm^2

25. [Volume] *

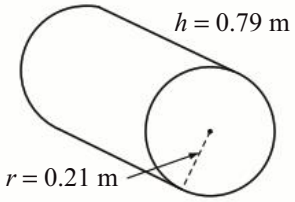
Calculate the volume of the square pyramid.



cm^3

26. [Surface Area] *

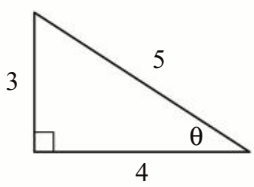
Using $\pi \approx \frac{22}{7}$ find the total surface area of the cylinder.



m^2

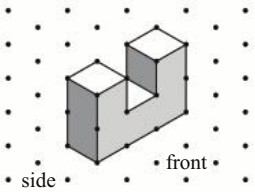
27. [Pythagoras / Trigonometry] *

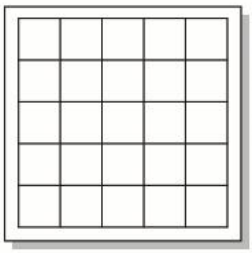
Use the triangle to calculate the value of sin θ.



28. [Shape / Location]

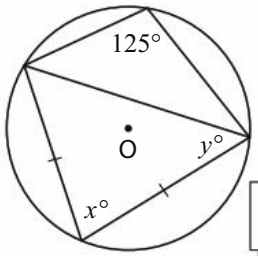
Draw the view from the front of the solid.





29. [Angles] *

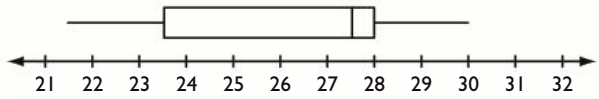
Find the values of $x°$ and $y°$.



$x° =$ $y° =$

30. [Statistics]

For the box-and-whisker plot, find the range and the interquartile range (IQR).



range = IQR =

31. [Probability]

If two dice are tossed, what is the probability of rolling two odd numbers?

32. [Problem Solving 1] *

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

33. [Problem Solving 2] *

I think of a two-digit number which I multiply by 2. I then divide the result by 3, multiply this result by 4 and finally divide by 5. Find the original two-digit number given that at every stage of the process, the result remained a two-digit number.

MATHS MATE

Term 2 - Sheet 2

Name: .....

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

Parent's Signature: .....

1. [Long ×,÷] *

$36 \times 15 =$

2. [Decimal +,–]

$1 - 0.611 =$

3. [Decimal ×,÷]

$3.05 \times 0.04 =$

4. [Fraction +,–] *

$\frac{d}{5} - \frac{d}{15} =$

5. [Fraction ×,÷] *

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

6. [Percentages] *

My pay rise of 3% means I earn an extra $27 per week. What is my weekly wage after the pay rise?

$

7. [Integer +,–] *

$2 - (5 + 10) =$

8. [Integer ×,÷]

$(+6) \times (+3) \div (-9) =$

9. [Rates / Ratios] *

Albury and Wagga Wagga are 130 km apart. How many centimetres apart are they on a map with a scale factor of 1 : 250 000?

10. [Indices] *

Simplify $(2x^0)^{-2}$

11. [Square Roots / Surds] *

Between which two consecutive whole numbers does $2\sqrt{6}$ lie?

12. [Order of Operations] *

$(2 + 8) \times (5 + 18) =$

13. [Exploring Number] *

100 kg of tomatoes were picked from a 100 m^2 paddock. At this rate how many hectares are required to produce 4 tonnes of tomatoes?

14. [Scientific Notation]

Which is the order of magnitude of 0.018?

[i.e. What power of 10 appears in the scientific notation of the number? OR What power of 10 is the number closest to?]

A) 10^{-2} B) 10^{-1}

C) 10^{1} D) 10^{2}

15. [Number Patterns]

Complete the pattern:

$8, 7\frac{1}{3}, 6\frac{2}{3}, 6,$ ___ , ___

16. [Expressions]

Find the difference between the following polynomials:

$(x^2 + 2x + 3) - (x^2 - 2x + 1)$

17. [Substitution] *

If $a = 4$ and $b = 5$ simplify $\frac{10}{b} + \frac{ab}{10}$

18. [Expansion] *

Expand and simplify

$3(2 - x)^2 + 2x$

19. [Factorisation]

Factorise

$x^2 - 6x + 9$

20. [Equations] *

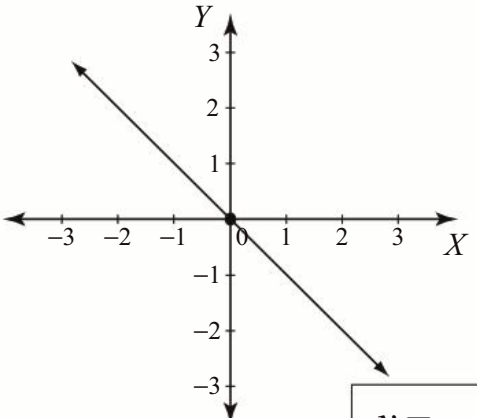
Solve the simultaneous equations:

$2x + y = 7$

$2x - y = 1$

21. [Graphs & Functions]

Find the equation of the line.



$y =$

QUOTE OF THE WEEK: An expert is a person who avoids small error as he sweeps on to the grand fallacy. Benjamin Stolberg

22. [Units of Measurement / Time] *

How many square metres are there in 3000 square centimetres?

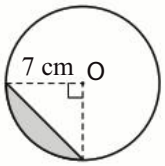
23. [Perimeter] *

The largest pyramid in the world is the Quetzalcóatl pyramid south-east of Mexico City. The temple mound has a height of only 54 metres but its square base covers an area of 16 hectares. Find the perimeter of its base.

m

24. [Area] *

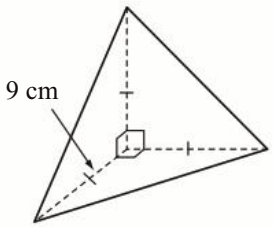
Using $\pi \approx \frac{22}{7}$ find the area of the shaded region.



cm^2

25. [Volume] *

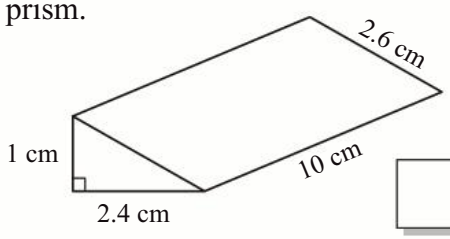
Calculate the volume of the triangular pyramid.



cm^3

26. [Surface Area] *

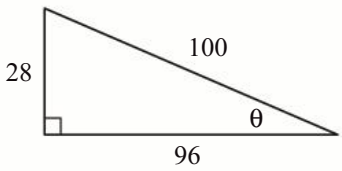
Find the total surface area of the triangular prism.



cm^2

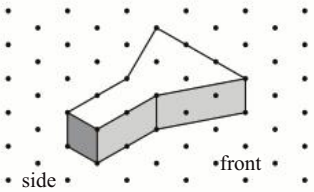
27. [Pythagoras / Trigonometry] *

Use the triangle to calculate the value of sin θ.



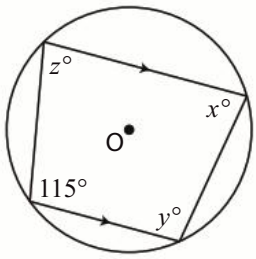
28. [Shape / Location]

Draw the view from the front of the solid.



29. [Angles] *

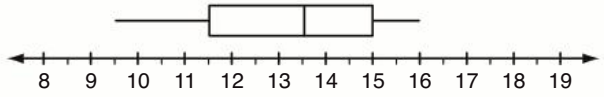
Find the values of $x°$, $y°$ and $z°$.



$x° =$ $y° =$ $z° =$

30. [Statistics]

For the box-and-whisker plot, find the range and the interquartile range (IQR).



range = IQR =

31. [Probability]

If two dice are tossed, what is the probability of rolling a double?

32. [Problem Solving 1] *

Which of the following fractions is the largest?

A) $\frac{111}{221}$ B) $\frac{75}{151}$ C) $\frac{333}{998}$ D) $\frac{113}{225}$ E) $\frac{101}{301}$

33. [Problem Solving 2] *

The number 105 can be expressed as a sum of two or more consecutive, positive integers in seven different ways. One such sequence begins with 12:

$12 + 13 + 14 + 15 + 16 + 17 + 18 = 105$

With which numbers do the other 6 sequences begin?

MATHS MATE

Term 2 - Sheet 3

Name: .....

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

Parent's Signature: .....

1. [Long ×,÷] *

$26 \times 18 =$

2. [Decimal +,–]

$1 - 0.45 =$

3. [Decimal ×,÷]

$48 \div 0.6 =$

4. [Fraction +,–] *

$\frac{w}{2} + \frac{w}{3} =$

5. [Fraction ×,÷] *

$6 \times 1\frac{3}{5} =$

6. [Percentages] *

A recent 2% increase in my rent costs me an extra $5 per week. How much rent do I pay now?

$

7. [Integer +,–] *

$-7 + (4 - 8) =$

8. [Integer ×,÷]

$(+2) \times (-3) \times (+7) =$

9. [Rates / Ratios] *

On a map the distance between Cairns and Mareeba is 8 cm. What is the scale factor if the actual distance is 64 km?

1 :

10. [Indices] *

Evaluate $\frac{1}{2^{-3}}$

11. [Square Roots / Surds] *

Between which two consecutive whole numbers does $4\sqrt{5}$ lie?

12. [Order of Operations] *

$(9 + 3) - 6 \times 4 =$

13. [Exploring Number] *

A cheetah can move 17 m in 2 bounds. At this rate, what distance will it cover in 11 bounds?

m

14. [Scientific Notation]

Which is the order of magnitude of 3.8×205?

[i.e. What power of 10 appears in the scientific notation of the number? OR What power of 10 is the number closest to?]

A) 10^0 B) 10^1

C) 10^2 D) 10^3

15. [Number Patterns]

Complete the pattern:

6.4, 3.2, 1.6, 0.8, ___ , ___

16. [Expressions]

Add the following polynomials:

$(-5y^2 - 9y + 4) + (8y^2 - 4y - 10)$

17. [Substitution] *

If $e = 3$ and $f = 5$, simplify $\frac{ef^2}{5}$

18. [Expansion] *

Expand and simplify

$(x + y)^2$

19. [Factorisation]

Factorise

$9x^2 - 4y^2$

20. [Equations] *

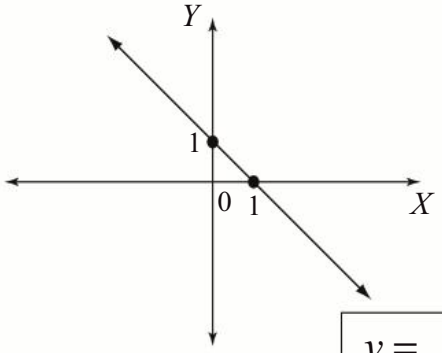
Solve the simultaneous equations:

$4x + 3y = 8$

$2x + 3y = 10$

21. [Graphs & Functions]

Find the equation of the line.



$y =$

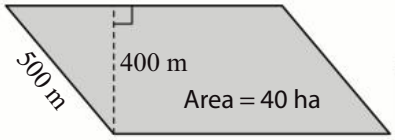
QUOTE OF THE WEEK: Prayer is not asking. It is a longing of the soul. It is a daily admission of one's weakness. Mahatma Gandhi

22. [Units of Measurement / Time]

Change 2.75 cm^3 into mm^3.

23. [Perimeter] *

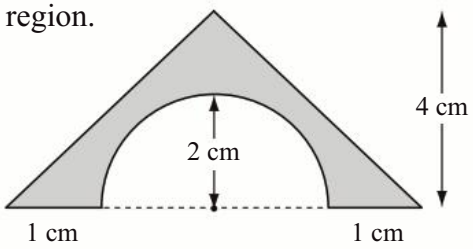
Find the perimeter of the parallelogram.



m

24. [Area] *

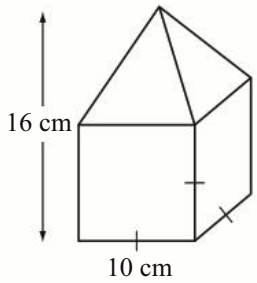
Using $\pi \approx 3.14$ find the area of the shaded region.



cm^2

25. [Volume] *

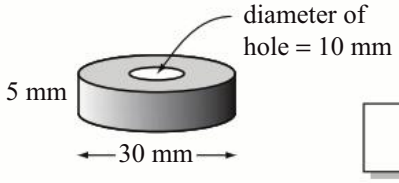
A wooden toy is constructed as shown. It is in the shape of a cube with a square pyramid on top. Find the volume of wood in the toy.



cm^3

26. [Surface Area] *

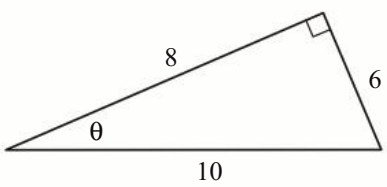
Using $\pi \approx 3.14$ find the total surface area of the washer.



mm^2

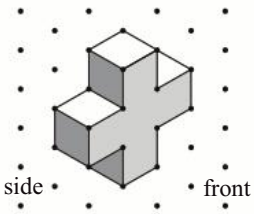
27. [Pythagoras / Trigonometry] *

Use the triangle to calculate the value of $\cos\theta$.



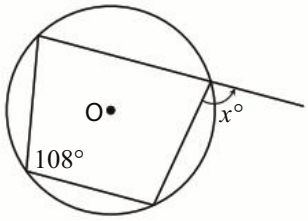
28. [Shape / Location]

Draw the view from the side of the solid.



29. [Angles] *

Find the value of $x°$.

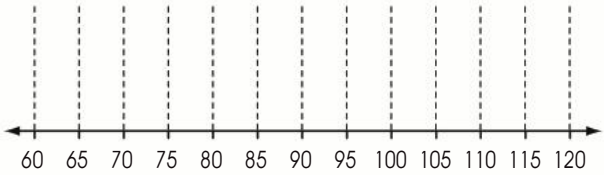


30. [Statistics]

This data shows the number of people boarding each of 20 flights at an airport:

60, 75, 100, 84, 110, 75, 73, 95, 69, 88,
72, 100, 106, 92, 82, 87, 98, 109, 115, 93

Draw a box-and-whisker plot for this data.



31. [Probability]

If two dice are thrown, what is the probability of obtaining an even number on one die and an odd number on the other?

32. [Problem Solving 1] *

$24^2 - 2 \times 24 \times 19 + 19^2 =$

33. [Problem Solving 2] *

Each letter stands for a different digit. What number does ABC represent?

$$\begin{array}{r} A\,B\,C \\ \times \quad\; B \\ \hline A\,A\,B\,B \end{array}$$

MATHS MATE

Term 2 - Sheet 4

Name: .....

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

Parent's Signature: .....

1. [Long ×,÷]

$837 \div 9 =$

2. [Decimal +,–]

$1 - 0.028155 =$

3. [Decimal ×,÷]

$0.072 \div 0.9 =$

4. [Fraction +,–] *

$\frac{2r}{5} + \frac{r}{2} =$

5. [Fraction ×,÷] *

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

6. [Percentages] *

A library has 1290 books out on loan. If this represents 6% of the library's books, how many books remain in the library?

7. [Integer +,–] *

$-3 + (1 - 7) =$

8. [Integer ×,÷]

$(-7) \times (-6) \div (-3) =$

9. [Rates / Ratios] *

Sydney and Brisbane are 730 km apart. How many centimetres apart are they on a map with a scale factor of 1 : 100 000?

10. [Indices] *

Evaluate $\frac{1}{5^{-3}}$

11. [Square Roots / Surds] *

Between which two consecutive whole numbers does $4\sqrt{2}$ lie?

12. [Order of Operations] *

$(14 \times 6 - 21) \div 7 =$

13. [Exploring Number] *

A factory produces 3 L of juice from 10 kg of oranges. At this rate how much juice could be produced from 36 kg of oranges?

L

14. [Scientific Notation]

Which is the order of magnitude of 0.0128?

[i.e. What power of 10 appears in the scientific notation of the number? OR What power of 10 is the number closest to?]

A) 10^{-5} B) 10^{-4}

C) 10^{-3} D) 10^{-2}

15. [Number Patterns]

Complete the pattern:

4, 2, 1, 0.5, ___ , ___

16. [Expressions]

Find the difference between the following polynomials:

$(y^3 - 5y^2 + y) - (-y^2 - 3y - 2)$

17. [Substitution] *

If $x = 2$, $y = 5$ and $z = 10$, simplify $\frac{xyz}{50}$

18. [Expansion] *

Expand and simplify $(x + 3y)^2$

19. [Factorisation]

Factorise $8c^2 - 2d^2$

20. [Equations] *

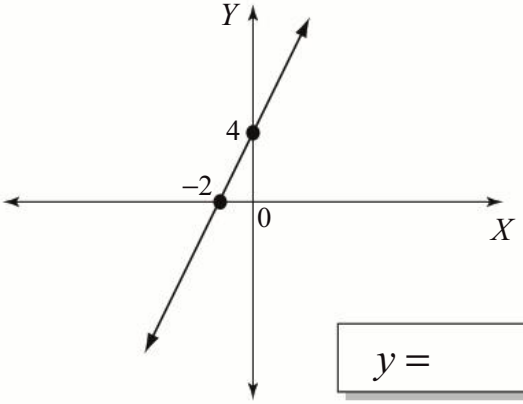
Solve the simultaneous equations:

$5x + 3y = 6$

$5x + y = -2$

21. [Graphs & Functions]

Find the equation of the line.



$y =$

QUOTE OF THE WEEK: The reason some parents want their children to play the piano instead of the violin is that it's harder to lose a piano.

22. [Units of Measurement / Time]

Convert 0.02 m^3 to mm^3.

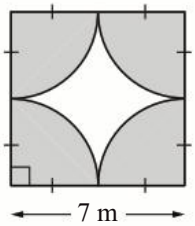
23. [Perimeter] *

A rectangular block of land is 50 metres wide and has an area of 2 hectares. Find the length of the block of land.

m

24. [Area] *

Using $\pi \approx \frac{22}{7}$ find the shaded area.

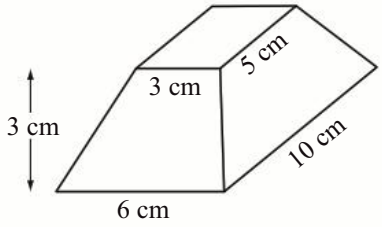


m^2

25. [Volume] *

A gold ingot is in the shape of a truncated pyramid. What is its volume?

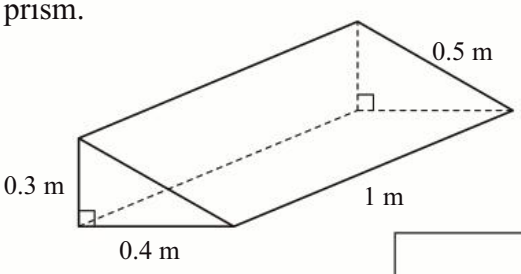
[Hint: Consider the ingot as the solid left after a rectangular pyramid is cut from the top of a larger rectangular pyramid.]



cm^3

26. [Surface Area] *

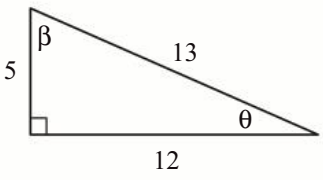
Find the total surface area of the triangular prism.



m^2

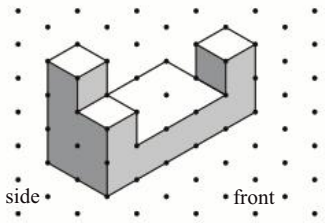
27. [Pythagoras / Trigonometry] *

Use the triangle to calculate the value of $\tan \beta$.



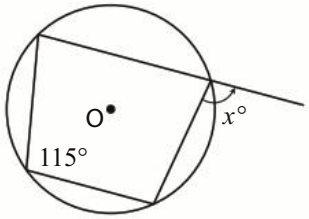
28. [Shape / Location]

Draw the view from the front of the solid.



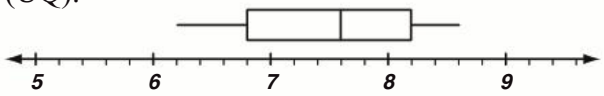
29. [Angles] *

Find the value of $x°$.



30. [Statistics]

For the box-and-whisker plot, find the median, the lower quartile (LQ) and the upper quartile (UQ).



median = LQ = UQ =

31. [Probability]

If two dice are thrown one after the other, what is the probability of getting a 2 on the second die?

32. [Problem Solving 1] *

Find the value of the product:

$$\left(1+\frac{2}{3}\right)\left(1+\frac{2}{5}\right)\left(1+\frac{2}{7}\right).....\left(1+\frac{2}{17}\right)\left(1+\frac{2}{19}\right)$$

33. [Problem Solving 2] *

If a, b and c represent the side lengths of a triangle and

$$\frac{c-b}{a}+\frac{a-c}{b}+\frac{b-a}{c}=0$$

what type of triangle is it?

MATHS MATE

Term 2 - Sheet 5

Name: .....

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

Parent's Signature: .....

1. [Long ×,÷]

$508 \times 6 =$

2. [Decimal +,–]

$5 - 0.641 =$

3. [Decimal ×,÷]

$1.6 \times 0.09 =$

4. [Fraction +,–] *

$\frac{5}{6} - \frac{7}{15} =$

5. [Fraction ×,÷]

$\frac{1}{4}(8 + 20g) =$

6. [Percentages] *

Sugar is added to 400 g of cream, and the mix is beaten to produce 500 g of whipped cream. What is the percentage of sugar in the whipped cream?

7. [Integer +,–]

$(-5q) + (-2q) =$

8. [Integer ×,÷] *

$(2 - 5) \times (2 - 5) =$

9. [Rates / Ratios] *

To visit Pluto, a spaceship would have to travel approximately 5 600 000 000 km from Earth. How long would this journey take travelling at 40 000 km/h?

h

10. [Indices]

Simplify $\frac{20a^5b^6}{5a^2b^3}$

11. [Square Roots / Surds]

Expand and simplify

$\sqrt{2}(3 + \sqrt{2})$

12. [Order of Operations] *

$(12 - 8) \times (8 - 12) =$

13. [Exploring Number] *

Four people can build a hut in 10 days. At this rate how many people are needed to build a similar hut in 8 days?

14. [Scientific Notation]

Estimate the order of magnitude of 89.5×21.1

15. [Number Patterns]

Write the first four terms of the sequence $t_n = 2^n$ where $n \geq 1$

16. [Expressions]

Write algebraic expressions for three consecutive whole numbers starting with n.

17. [Substitution] *

If $u = -3$ and $v = -2$, find the value of $2u(u - 3v)$

18. [Expansion] *

Expand and simplify $(2a + 3)(2a - 5)$

19. [Factorisation]

Factorise $x^2 + 5x + 4$

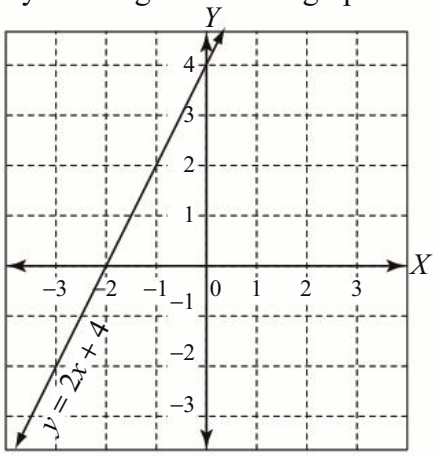
20. [Equations] *

Solve for x:

$\frac{2x}{3} - \frac{x}{2} = 4$

21. [Graphs & Functions]

Solve $y = 2x + 4$ and $x + y = 1$ simultaneously by drawing the second graph.



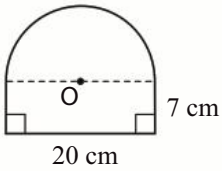
QUOTE OF THE WEEK: While we cannot will ourselves to grace, we can open ourselves up to its miraculous coming. Scott Peck

22. [Units of Measurement / Time] *

The Earth has a density of 5.5 g/cm^3. Express the density in kg/m^3.

23. [Perimeter] *

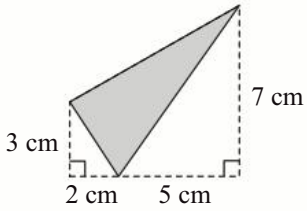
Using $\pi \approx 3.14$ calculate the perimeter of the shape.



cm

24. [Area] *

Find the area of the shaded triangle.



cm^2

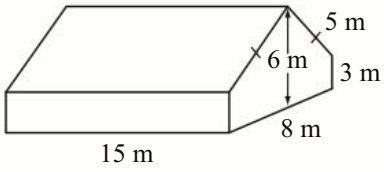
25. [Volume] *

Using $V = \pi r^2 h$ where $\pi \approx 3.14$, find the volume of a cylinder of base radius 2 m and height 25 m.

m^3

26. [Surface Area] *

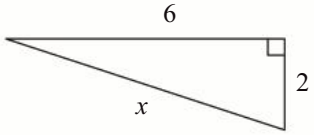
Find the total surface area of the solid.



m^2

27. [Pythagoras / Trigonometry] *

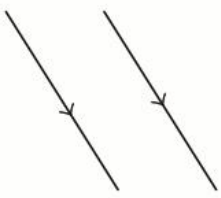
Find, in surd form, the value of x.



28. [Shape / Location]

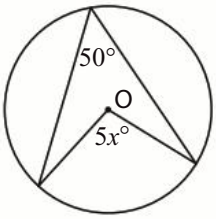
The shape formed by all the points equally distanced from these two parallel lines is:

A) a point
B) a line
C) two parallel lines
D) two intersecting lines



29. [Angles] *

Find the value of $x°$.



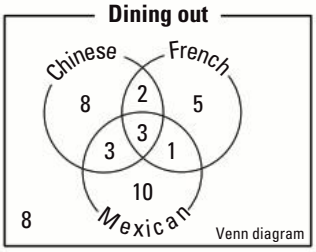
30. [Statistics]

A die was rolled 40 times and the results were recorded. Find the value of the lower quartile.

Score	1	2	3	4	5	6
Frequency	6	7	8	4	8	7

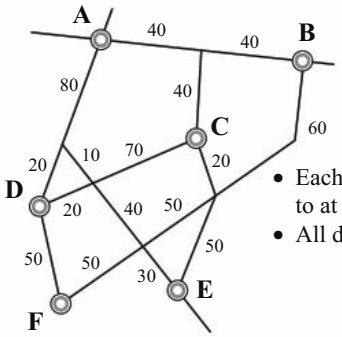
31. [Probability]

Forty people were asked about the types of restaurants they had eaten at in the last 12 months. Find the probability that a surveyed person chosen at random had not eaten at a Chinese restaurant in that time.



32. [Problem Solving 1] *

A pay television station wishes to lay cables along existing roads to connect each town, A to F, to a fibre optic network. Calculate the minimum length of cable required.



- Each town must be connected to at least one other town.
- All distances are in kilometres.

km

33. [Problem Solving 2] *

Triangle A is divided into 2 smaller triangles B and C. Triangle B is larger than triangle C. All three triangles A, B and C, are right-angled triangles with sides in the ratio 3 : 4 : 5. Find the ratio

Area of A : Area of B : Area of C

MATHS MATE

Term 2 - Sheet 6

Name: .....

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

Parent's Signature: .....

1. [Long ×,÷] *

$690 \div 15 =$

2. [Decimal +,–]

$2.8 - 0.111 =$

3. [Decimal ×,÷]

$0.308 \div 0.4 =$

4. [Fraction +,–] *

$\frac{3}{10} + 2\frac{5}{8} =$

5. [Fraction ×,÷] *

$\frac{2}{3}(6t + 3) =$

6. [Percentages] *

A fuel additive increased the racing car's maximum speed by 5 km/h or 2%. What is the car's new maximum speed?

km/h

7. [Integer +,–]

$(-z) + (-8z) =$

8. [Integer ×,÷] *

$(6 - 8) \times (6 + 8) =$

9. [Rates / Ratios] *

Light takes 8 minutes to travel from the Earth to the Sun. Find the distance from the Earth to the Sun given the speed of light is 300 000 km/s.

km

10. [Indices]

Simplify $\frac{4xy^2 \times x^2y}{8x^3y^3}$

11. [Square Roots / Surds]

Expand and simplify

$\sqrt{5}(2 - \sqrt{5})$

12. [Order of Operations] *

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

13. [Exploring Number] *

Three machines harvested a field in 12 days. How many days would it have taken for 9 similar machines to do the same job?

days

14. [Scientific Notation]

Estimate the order of magnitude of 5.15×28

15. [Number Patterns]

Write the first four terms of the sequence $t_n = (2n - 1)^2$ where $n \geq 1$

16. [Expressions]

Write a simple expression for the average of two consecutive whole numbers where the smaller of the two numbers is n.

17. [Substitution] *

If $p = -\frac{1}{5}$ and $q = \frac{1}{4}$, find the value of $p - 3q$

18. [Expansion] *

Expand and simplify

$(5x - 2)(2x - 5)$

19. [Factorisation]

Factorise

$y^2 + 6y + 5$

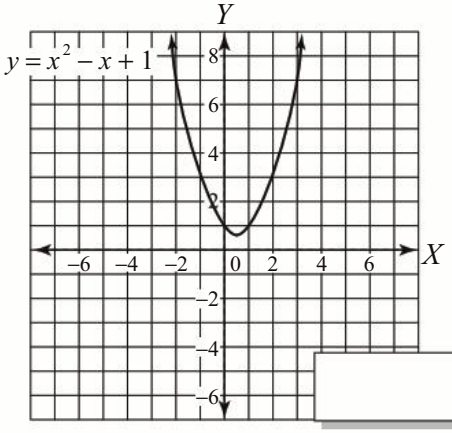
20. [Equations] *

Solve for x:

$\frac{3x}{2} + \frac{x}{5} = 0$

21. [Graphs & Functions]

Solve $y = x^2 - x + 1$ and $y = 2x + 1$ simultaneously by drawing the second graph.



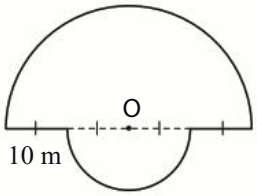
QUOTE OF THE WEEK: Opportunity is missed by most people because it is dressed in overalls and looks like work. Thomas Edison

22. [Units of Measurement / Time] *

Gold has a density of 19.29 g/cm^3. Express the density in kg/m^3.

23. [Perimeter] *

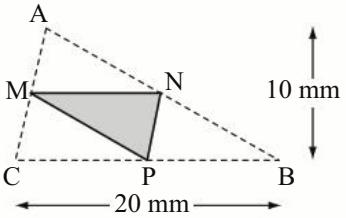
Use $\pi \approx 3.14$ to find the perimeter of the shape.



m

24. [Area] *

Find the area of the shaded region, given that M, N and P are midpoints of the sides of triangle ABC.



mm^2

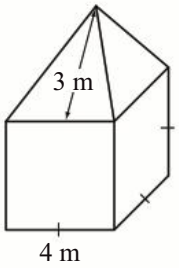
25. [Volume] *

Using $V = \frac{1}{3}\pi r^2 h$ where $\pi \approx 3.14$, find the volume of a cone of base radius 6 mm and height 25 mm.

mm^3

26. [Surface Area] *

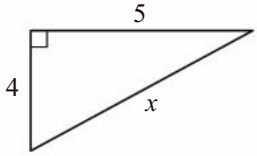
A block of wood has the shape of a square pyramid on top of a cube as shown below. Find its total surface area.



m^2

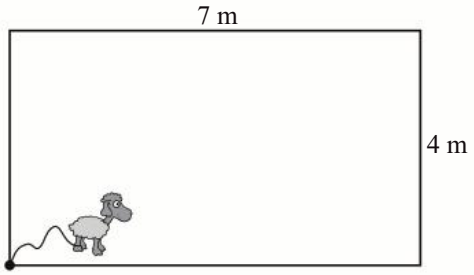
27. [Pythagoras / Trigonometry] *

Find, in surd form, the value of x.



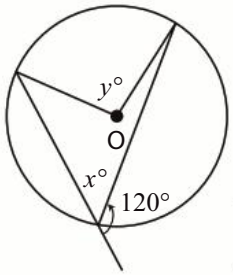
28. [Shape / Location]

A lamb is tethered by a 5 m rope to the corner of a rectangular yard. Show the dimensions and the shape of the region inside the yard over which the lamb can graze.



29. [Angles] *

Find the values of $x°$ and $y°$.



$x° =$ $y° =$

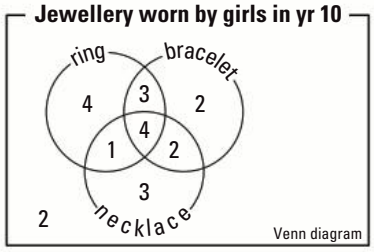
30. [Statistics]

Two dice are rolled 20 times and their total score recorded. Find the upper quartile for the results.

Score	2	3	4	5	6	7	8	9	10	11	12
Frequency	1	0	3	2	4	3	3	1	3	0	0

31. [Probability]

Find the probability that a girl selected at random from the surveyed group, is wearing a necklace but neither a ring nor a bracelet.



32. [Problem Solving 1] *

Find the sum:
$(-1)^n + (-1)^{n+1} + (-1)^{n+2} + (-1)^{n+3}$
given that n is a natural number.

33. [Problem Solving 2] *

What are the last two digits in the expansion of 6^{666}?

MATHS MATE

Term 2 - Sheet 7

Name: .....

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

Parent's Signature: .....

1. [Long ×,÷]

$49.8 \div 6 =$

2. [Decimal +,–]

$10 - 0.059 =$

3. [Decimal ×,÷]

$32.4 \div 90 =$

4. [Fraction +,–] *

$1\frac{3}{8} + \frac{11}{12} =$

5. [Fraction ×,÷] *

$\frac{1}{3}(9 + 3k) =$

6. [Percentages] *

A 20% discount on my shirt saved me $12. How much did I pay?

$

7. [Integer +,–]

$(+6w) - (-2w) =$

8. [Integer ×,÷] *

$(1 - 7) \times (2 - 8) =$

9. [Rates / Ratios] *

Mars is approximately 54 600 000 km from Earth. How long does it take the light to travel from Mars to Earth? [The speed of light is approximately 300 000 km/s.]

min s

10. [Indices]

Simplify $\frac{12s^5t^3 \times 2s}{4s^2t}$

11. [Square Roots / Surds] *

Expand and simplify

$2\sqrt{3}(3 + \sqrt{3})$

12. [Order of Operations] *

$1 + 3 \times 5^2 - 7 =$

13. [Exploring Number] *

Six workers can harvest a hectare of vines in 5 hours. At this rate how many workers would be needed to complete the same job in 3 hours?

14. [Scientific Notation]

Estimate the order of magnitude of 399×21

15. [Number Patterns]

Write the first four terms of the sequence $t_n = n^2 - n + 1$ where $n \geq 1$

16. [Expressions] *

Write a simple algebraic expression for the sum of three consecutive whole numbers where the smallest of the three numbers is $n - 1$

17. [Substitution] *

If $a = 1.2$, $b = -0.5$ and $c = 0.8$, evaluate the expression $a + 2b - 3c$

18. [Expansion] *

Expand and simplify $(x^2 + 2)(x^2 + 5)$

19. [Factorisation]

Factorise $x^2 - 3x + 2$

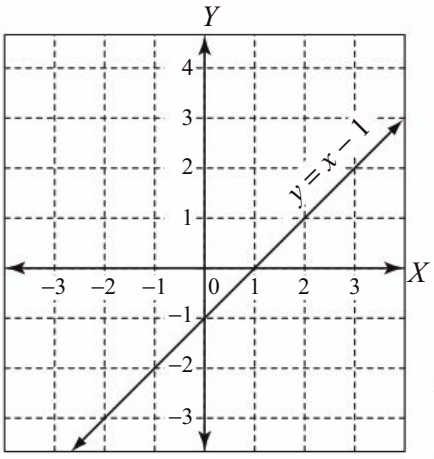
20. [Equations] *

Solve for x:

$\frac{3x}{4} - x = 10$

21. [Graphs & Functions]

Solve $y = x - 1$ and $y = 3x + 1$ simultaneously by drawing the second graph.



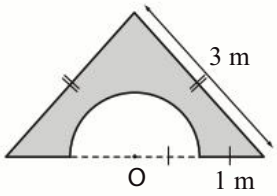
QUOTE OF THE WEEK: Reading is to the mind what exercise is to the body. Sir Richard Steele

22. [Units of Measurement / Time] *

Aluminium has a density of 2.699 g/cm^3.
Express the density in kg/m^3.

23. [Perimeter] *

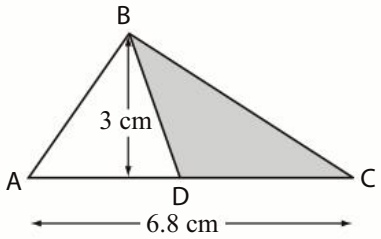
Use $\pi \approx 3.14$ to find the perimeter of the shaded region.



m

24. [Area] *

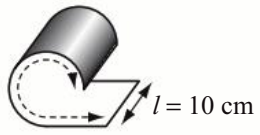
Find the length AD such that triangle ABD has the same area as triangle BCD.



cm

25. [Volume] *

A rectangle of dimensions 31.4 cm by 10 cm is rolled to form a cylinder as shown below. Find the volume of the cylinder. (Use $\pi \approx 3.14$)

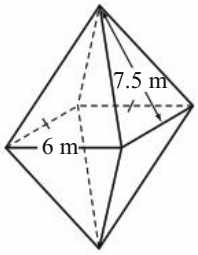


w = 31.4 cm

cm^3

26. [Surface Area] *

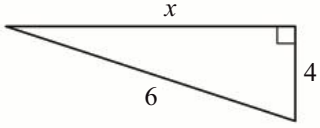
Find the total surface area of the solid.



m^2

27. [Pythagoras / Trigonometry] *

Find, in surd form, the value of x.



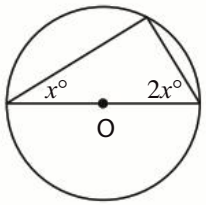
28. [Shape / Location]

The shape formed by all the points equally distanced from these two points is:

A) a point
B) a line
C) two parallel lines
D) two intersecting lines

29. [Angles] *

Find the value of $x°$.



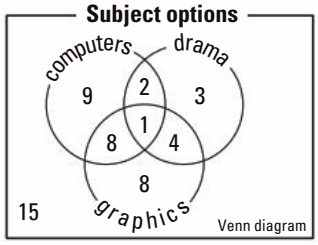
30. [Statistics]

Find the interquartile range for the distribution.

Number of pets	0	1	2	3	4	5
Frequency	6	10	7	4	3	0

31. [Probability]

If a surveyed student is chosen at random, what is the probability that the student is not studying Drama?



32. [Problem Solving 1] *

Some men want to cross a lake. If there are 4 men in each boat, 7 men will remain on the shore. If there are 7 men in each boat, 2 boats will be empty. How many men and boats are there?

men = boats =

33. [Problem Solving 2] *

Lee sent this phone message home.

```
  S E N D
+ M O R E
---------
$ M O N E Y
```

How much \$MONEY does Lee require?
[Every letter represents a different digit.]

\$

MATHS MATE

Term 2 - Sheet 8

Name: .....

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

Parent's Signature: .....

1. [Long ×,÷]

$366.8 \div 7 =$

2. [Decimal +,–]

$4.2 - 0.0035 =$

3. [Decimal ×,÷]

$6.48 \div 0.08 =$

4. [Fraction +,–] *

$2\frac{5}{12} + 1\frac{3}{4} =$

5. [Fraction ×,÷] *

$\frac{2}{5}(10m - 5) =$

6. [Percentages] *

A 10% discount on my air fare saved me $140. How much did I pay?

$

7. [Integer +,–]

$(+2z) + (-6z) =$

8. [Integer ×,÷] *

$(6 - 3) \times (3 - 6) =$

9. [Rates / Ratios] *

Mercury Messenger probe, launched in 2004, will arrive on Mercury in 2011. If Mercury is approximately 77 million km away from Earth, what is the average speed of the probe in km/h during the seven year journey?

[Consider 1 year = 8760 h. Round to the nearest whole number.]

10. [Indices] *

Simplify $(a^2)^4 \div a^5$

11. [Square Roots / Surds] *

Expand and simplify

$2\sqrt{5}(3 + 2\sqrt{5})$

12. [Order of Operations] *

$3 \times 8 + 35 \div 7 =$

13. [Exploring Number] *

The pool can be filled in 2 hours using 3 garden hoses. How much time would be required if a fourth hose were used?

h

14. [Scientific Notation]

Estimate the order of magnitude of 105×210

15. [Number Patterns]

Write the first four terms of the sequence $t_n = \frac{n}{n+1}$ where $n \geq 1$

16. [Expressions] *

Write a simple algebraic expression for the sum of three consecutive even numbers where the smallest of the three numbers is n.

17. [Substitution] *

If $x = \frac{1}{6}$, $y = \frac{2}{9}$ and $z = \frac{5}{18}$, evaluate the expression $2x - y + 2z$

18. [Expansion] *

Expand and simplify $(y^2 + 6)(y^2 - 6)$

19. [Factorisation]

Factorise $a^2 - 6a + 8$

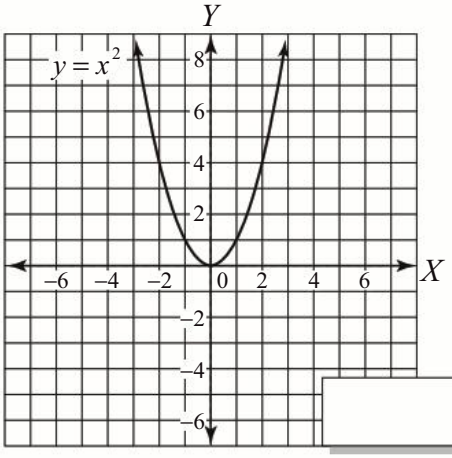
20. [Equations] *

Solve for x:

$\frac{4x}{2} + \frac{x}{3} = 14$

21. [Graphs & Functions]

Solve $y = x^2$ and $y = x + 2$ simultaneously by drawing the second graph.



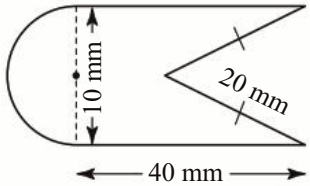
QUOTE OF THE WEEK: As we jog on, either laugh with me, or at me, or in short do anything, - only keep your temper. Laurence Sterne

22. [Units of Measurement / Time] *

Water has a density of 1 g/cm^3. Express the density in kilograms per litres.

23. [Perimeter] *

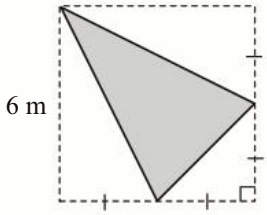
Use $\pi \approx 3.14$ to find the perimeter of the shape.



mm

24. [Area] *

Find the area of the shaded region.



m^2

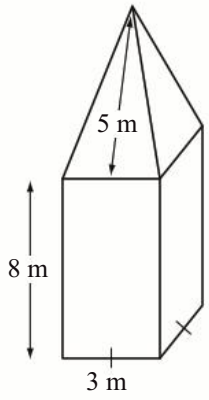
25. [Volume] *

Using $\pi \approx \frac{22}{7}$ find the volume of a cylindrical grain silo of base diameter 14 m and height 15 m.

m^3

26. [Surface Area] *

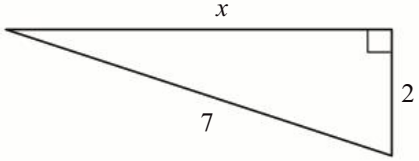
An obelisk type monument has the shape of a pyramid on top of a square prism. Find its total surface area.



m^2

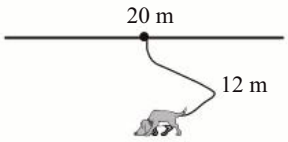
27. [Pythagoras / Trigonometry] *

Find, in surd form, the value of x.



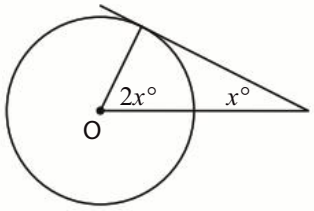
28. [Shape / Location]

A dog is tethered by a 12 m chain to a post at the midpoint of a straight 20 m long dog proof fence. Show the dimensions and the shape of the region over which the dog can wander.



29. [Angles] *

Find the value of $x°$.



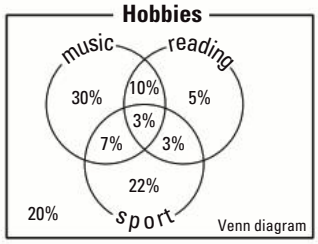
30. [Statistics]

Find the interquartile range for the distribution.

Number of goals per game	0	1	2	3	4	5
Frequency	3	12	9	4	3	1

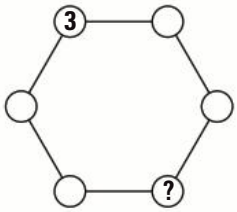
31. [Probability]

Find the probability that a surveyed person selected at random did not list music as a hobby.



32. [Problem Solving 1] *

At each vertex of a hexagon, an integer is written. No two integers are the same, and each is the sum of the numbers at the two vertices next to it. What number is directly opposite the number 3?



33. [Problem Solving 2] *

Three friends need to travel into town, a distance of 30 km. They have a motorbike that is able to carry one or two of them at a speed of 60 km/h and they can jog at a speed of 12 km/h. What is the least time required for all three to reach town?

h

MATHS MATE

Name: .....

Class: .....

Teacher: .....

Worksheet Results

Term 3

		Sheet 1	Sheet 2	Sheet 3	Sheet 4	Sheet 5	Sheet 6	Sheet 7	Sheet 8
NUMBER & ALGEBRA	1. [Long ×,÷]	1	1	1	1	1	1	1	1
	2. [Decimal +,–]	2	2	2	2	2	2	2	2
	3. [Decimal ×,÷]	3	3	3	3	3	3	3	3
	4. [Fraction +,–]	4	4	4	4	4	4	4	4
	5. [Fraction ×,÷]	5	5	5	5	5	5	5	5
	6. [Percentages]	6	6	6	6	6	6	6	6
	7. [Integer +,–]	7	7	7	7	7	7	7	7
	8. [Integer ×,÷]	8	8	8	8	8	8	8	8
	9. [Rates / Ratios]	9	9	9	9	9	9	9	9
	10. [Indices]	10	10	10	10	10	10	10	10
	11. [Square Roots / Surds]	11	11	11	11	11	11	11	11
	12. [Order of Operations]	12	12	12	12	12	12	12	12
	13. [Exploring Number]	13	13	13	13	13	13	13	13
	14. [Scientific Notation]	14	14	14	14	14	14	14	14
	15. [Number Patterns]	15	15	15	15	15	15	15	15
	16. [Expressions]	16	16	16	16	16	16	16	16
	17. [Substitution]	17	17	17	17	17	17	17	17
	18. [Expansion]	18	18	18	18	18	18	18	18
	19. [Factorisation]	19	19	19	19	19	19	19	19
	20. [Equations]	20	20	20	20	20	20	20	20
	21. [Graphs & Functions]	21	21	21	21	21	21	21	21
MEASUREMENT & GEOMETRY	22. [Units of Measurement / Time]	22	22	22	22	22	22	22	22
	23. [Perimeter]	23	23	23	23	23	23	23	23
	24. [Area]	24	24	24	24	24	24	24	24
	25. [Volume]	25	25	25	25	25	25	25	25
	26. [Surface Area]	26	26	26	26	26	26	26	26
	27. [Pythagoras / Trigonometry]	27	27	27	27	27	27	27	27
	28. [Shape / Location]	28	28	28	28	28	28	28	28
	29. [Angles]	29	29	29	29	29	29	29	29
STATISTICS & PROBABILITY	30. [Statistics]	30	30	30	30	30	30	30	30
	31. [Probability]	31	31	31	31	31	31	31	31
PROBLEM SOLVING	32. [Problem Solving 1]	32	32	32	32	32	32	32	32
	33. [Problem Solving 2]	33	33	33	33	33	33	33	33
	Total Correct								

MATHS MATE

Term 3 - Sheet 1

Name: .....

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

Parent's Signature: .....

1. [Long ×,÷] *

$29 \times 15 =$

2. [Decimal +,–] *

$x - 7.5 = 9.75$

$x =$

3. [Decimal ×,÷]

$17.5 \div x = 175$

$x =$

4. [Fraction +,–] *

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

5. [Fraction ×,÷] *

$2\frac{1}{4} \times 1\frac{3}{5} =$

6. [Percentages] *

What is the selling price of a TV set if it was originally worth $860 and it is discounted by 15%?

$

7. [Integer +,–] *

$(6 - 7) - (8 - 9) =$

8. [Integer ×,÷]

$\frac{6mn}{-2m} =$

9. [Rates / Ratios] *

A farmer pumps 288 000 L of water from the river daily to irrigate his land. How much water is being pumped every minute if the pump runs 24 hours a day?

L

10. [Indices]

Simplify and express using positive indices

$\frac{m^3}{m^{-2}}$

11. [Square Roots / Surds] *

Evaluate $\frac{\sqrt{3} \times 3\sqrt{2}}{\sqrt{24}}$

12. [Order of Operations] *

$4 \times 9 \div 4 =$

13. [Exploring Number]

Write 250% as an improper fraction in simplest form.

14. [Scientific Notation]

Express 3.14×10^3 as a basic numeral.

15. [Number Patterns]

Write the first four terms of the sequence $t_n = \frac{4n+1}{n}$ where $n \geq 1$

16. [Expressions]

Filtered water costs 8 cents per litre. How much would n litres cost?

cents

17. [Substitution] *

For what value of x is $\frac{1}{x+4}$ undefined?

18. [Expansion] *

Expand and simplify

$x(2x + 1)(1 - 3x)$

19. [Factorisation]

Factorise

$4x^2 + 12x + 5$

20. [Equations] *

Solve for x:

$x(x + 12) = 0$

21. [Graphs & Functions]

Complete the table of values for the parabola of equation $y = 3x^2 - 1$

x	–2	–1	0	1	2	3
y						

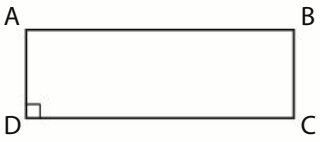
QUOTE OF THE WEEK: When you cannot get a compliment any other way, pay yourself one. Mark Twain

22. [Units of Measurement / Time]

How many millilitres in r litres?

23. [Perimeter] *

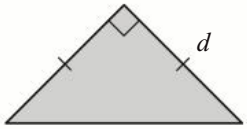
Find the perimeter of the rectangle ABCD if it has an area of 108 cm^2, and the ratio AB : BC is 3 : 1.



cm

24. [Area] *

Write a formula for the area A of the right-angled triangle.



$A =$

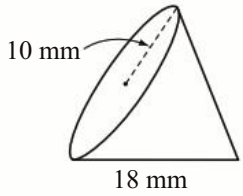
25. [Volume] *

A concrete path 1 m wide is to be constructed around a rectangular pool 3 m wide and 5 m long. What volume of concrete is required if the path is to have a thickness of 50 mm?

m^3

26. [Surface Area] *

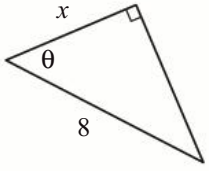
Use $TSA = \pi r(r + s)$ and $\pi \approx \frac{22}{7}$ to find the total surface area of the cone.



mm^2

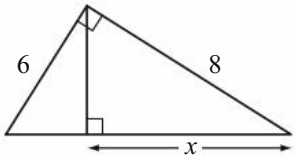
27. [Pythagoras / Trigonometry] *

Find the value of x, given $\cos\theta = 0.75$



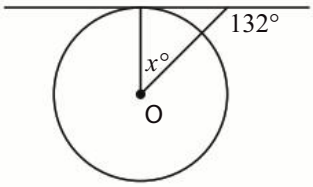
28. [Shape / Location] *

Using similarity, find the value of x.



29. [Angles] *

Find the value of $x°$.



30. [Statistics]

Complete the back-to-back stemplot for the following heights, measured in metres, of the students in a Year 10 class.

Height (m)

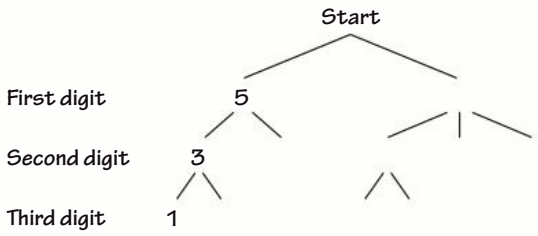
Boys:	1.50	1.64	1.75	1.67	1.49	1.70	1.63
	1.81	1.56	1.59	1.76	1.68	1.82	1.48
Girls:	1.53	1.62	1.48	1.65	1.71	1.56	1.48
	1.64	1.71	1.56	1.59	1.68	1.57	1.56

GIRLS leaf	stem	BOYS leaf
	1.4	
	1.5	
	1.6	
	1.7	
	1.8	

31. [Probability]

How many different three-digit numbers greater than 520 can be made using the digits 1, 3, 5 and 7 if the digits can not be repeated?

[Complete the tree diagram to help solve the problem.]



32. [Problem Solving 1] *

Which is larger, 2^{18} or 3^{12}?

[Hint: Neither logarithms nor calculator should be necessary.]

33. [Problem Solving 2] *

Using the digits of the year 1996 in the order in which they appear, insert any of the operations or signs +, −, ×, ÷, $\sqrt{\ }$, (,), !, to make an expression equal to 10.

1 9 9 6 = 10

MATHS MATE

Term 3 - Sheet 2

Name: .....

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

Parent's Signature: .....

1. [Long ×,÷] *

$38 \times 2.1 =$

2. [Decimal +,–] *

$x - 2.44 = 3.29$

$x =$

3. [Decimal ×,÷]

$4 \times x = 0.04$

$x =$

4. [Fraction +,–] *

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

5. [Fraction ×,÷] *

$1\frac{6}{7} \div 1\frac{1}{14} =$

6. [Percentages] *

A car costing $4000 is sold for $5000. What is the profit as a percentage of cost?

7. [Integer +,–] *

$(1 + 8) + (9 - 14) =$

8. [Integer ×,÷]

$\frac{-10qr}{-2q} =$

9. [Rates / Ratios] *

As of 2005 Barbara Blackburn was the fastest English language typist in the world. She had maintained 150 words per minute for 50 minutes. At this rate how many words did she type in half an hour?

words

10. [Indices]

Simplify and express using positive indices

$\frac{a^4 b^{-3}}{b^{-3}}$

11. [Square Roots / Surds] *

Evaluate $\frac{\sqrt{1\frac{1}{8}}}{\sqrt{8}}$

12. [Order of Operations] *

$6 \times (9 + 5) =$

13. [Exploring Number] *

Write the recurring decimal $0.\dot{1}$ as a fraction in simplest form.

14. [Scientific Notation]

Express 0.2×10^2 as a basic numeral.

15. [Number Patterns]

Write the first four terms of the sequence $t_n = \sqrt{n+2}$ where $n \geq 1$

16. [Expressions] *

If x books fill four shelves, how many books do we need to fill six shelves?

books

17. [Substitution] *

For what value of x is $\frac{-1}{2x - 6}$ undefined?

18. [Expansion] *

Expand and simplify

$-3x(x - 1)(x + 1)$

19. [Factorisation]

Factorise

$10y^2 + 17y + 3$

20. [Equations] *

Solve for x:

$x(x - 9) = 0$

21. [Graphs & Functions]

Complete the table of values for the parabola of equation $y = 2x^2 - 3$

x	–3	–2	–1	0	1	2	3
y							

QUOTE OF THE WEEK: A good time to keep your mouth shut is when you're in deep water. Sidney Goff

22. [Units of Measurement / Time]

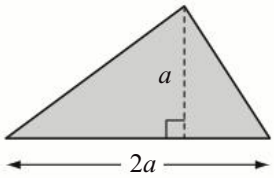
How many kilograms in n grams?

23. [Perimeter] *

How many kilometres of fence are required to enclose a rectangular paddock with an area of 60 km^2 if its width is 6 km?

24. [Area] *

Write a formula for the area A of the triangle.



$A =$

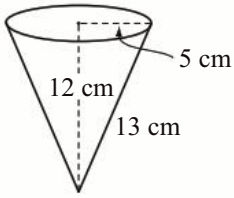
25. [Volume] *

Plastic is used to make a hollow cube which has an outer edge length of 5 cm. Find the volume of plastic used if each wall has a thickness of 5 mm.

cm^3

26. [Surface Area] *

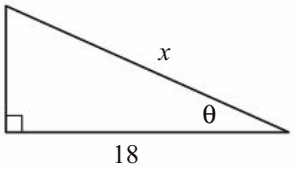
Using $\pi \approx 3.14$ find the total surface area of the cone.



cm^2

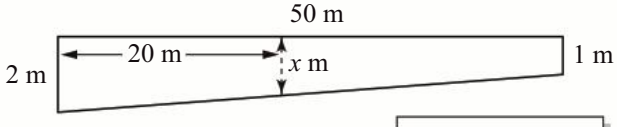
27. [Pythagoras / Trigonometry] *

Find the value of x, given $\cos\theta = 0.3$



28. [Shape / Location] *

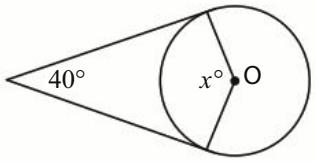
A side view from a plan of a swimming pool is shown below. What is the depth of the pool 20 m from the deep end?



m

29. [Angles] *

Find the value of $x°$.



30. [Statistics]

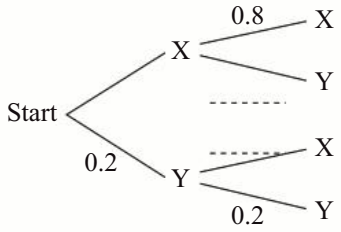
The back-to-back stem-and-leaf plot shows a comparison between the heights in centimetres of thirty students in a Year 10 class. Find the median height of all students in the class.

GIRLS leaf	stem	BOYS leaf
	18	0 1 1
3 0	17	0 2
5	16	4 6 8 8 9
7 4 1	15	2 9
9 6 2 2 0	14	3 6 7
8 5 0	13	5

cm

31. [Probability]

Complete the probability tree diagram.



Pr(XX) = 0.64

Pr(XY) = ...

Pr(YX) = ...

Pr(YY) = ...

32. [Problem Solving 1] *

The houses along our side of the street are numbered in consecutive odd numbers, the even numbers being on the other side of the street. Our house is number 69, but, had the numbering commenced at the other end of the street, our house would have been number 43. How many houses are there on our side of the street?

33. [Problem Solving 2] *

Charles Sturt wishes to cross the desert, an eight day trip. Charles and each of his helpers are able to carry supplies for a maximum of five days. How many helpers must start out with Charles if he is to cross the desert and all his helpers are to either cross with him or return safely to the starting point?

MATHS MATE

Term 3 - Sheet 3

Name: .....

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

Parent's Signature: .....

1. [Long ×,÷] *

$1.7 \times 43 =$

2. [Decimal +,–] *

$x - 0.814 = 0.077$

$x =$

3. [Decimal ×,÷]

$x \times 2.5 = 0.025$

$x =$

4. [Fraction +,–] *

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

5. [Fraction ×,÷] *

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

6. [Percentages] *

Oscar earns 0.5% commission on his real estate sales. How much did he earn in July if his total sales for the month were $2 080 000?

$

7. [Integer +,–] *

$(3 - 5) + (7 - 9) =$

8. [Integer ×,÷]

$\frac{-12x}{3} =$

9. [Rates / Ratios] *

Around 66 million tonnes of bananas are eaten in the world each year. How many tonnes are eaten in the world per month?

10. [Indices]

Simplify and express using positive indices

$\frac{p^{-3}q^{-3}}{p^2q^{-3}}$

11. [Square Roots / Surds] *

Evaluate $\sqrt{\frac{3}{5}} \times \sqrt{2\frac{2}{5}}$

12. [Order of Operations] *

$(7 + 11) \times (5 - 2) =$

13. [Exploring Number] *

Change the recurring decimal $1.\dot{8}$ to an improper fraction in simplest form.

14. [Scientific Notation]

Express 14.6×10^{-2} as a basic numeral.

15. [Number Patterns]

Write the first four terms of the sequence $t_n = (2n + 1)^2$ where $n \geq 1$

16. [Expressions] *

Express x km/h in m/s.

m/s

17. [Substitution] *

For what values of x is $\frac{13}{x(x-3)}$ undefined?

18. [Expansion] *

Expand and simplify

$y(y + 2)(2y - 1)$

19. [Factorisation]

Factorise

$6y^2 + y - 1$

20. [Equations] *

Solve for x:

$2x^2 + 4x = 0$

21. [Graphs & Functions]

Complete the table of values for the parabola of equation $y = x^2 - 4$

x	1	2	3	4	5	6
y						

QUOTE OF THE WEEK: The Lord gets his best soldiers out of the highlands of affliction. Charles Spurgeon

22. [Units of Measurement / Time]

How many days in h hours?

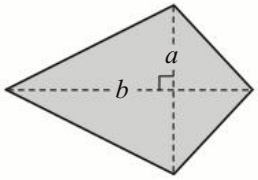
23. [Perimeter] *

A rectangle has an area of 72 cm^2. If its length is twice its width, find its perimeter.

cm

24. [Area] *

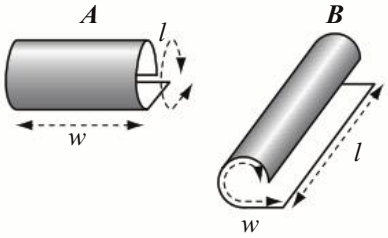
Write a formula for the area A of the shape.



$A =$

25. [Volume] *

A rectangular sheet of paper ($l > w$) can be rolled in two ways to form different cylinders (see A and B below). Write an expression for the volume of the cylinder with the greater capacity.

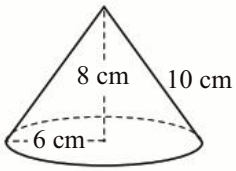


$V =$

26. [Surface Area] *

Find the total surface area of the cone.

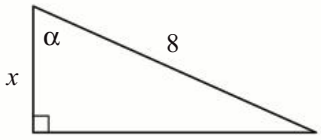
[Leave your answer as a multiple of π.]



cm^2

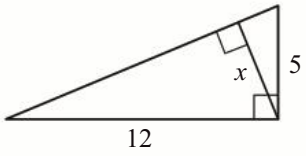
27. [Pythagoras / Trigonometry] *

Find the value of x, given $\cos \alpha = 0.45$



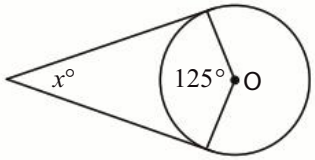
28. [Shape / Location] *

Using similarity, find the value of x.



29. [Angles] *

Find the value of $x°$.



30. [Statistics]

The maximum temperatures for Perth and Brisbane for the first 10 days in November are shown in the table. Complete the back-to-back stem-and-leaf plot to compare the data.

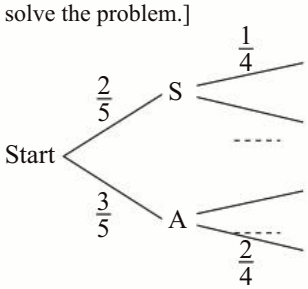
Maximum temperature (°C)

PERTH	20°	25°	18°	21°	19°	24°	30°	31°	32°	29°
BRISBANE	24°	22°	19°	18°	23°	26°	30°	32°	33°	30°

PERTH		BRISBANE
— —	1	— —
— — — — —	2	— — — —
— — —	3	— — — —

31. [Probability]

A box contains 2 science books and 3 atlases. Two books are to be taken from the box. If each book is equally likely to be selected, what is the probability that the selected books are both atlases? [Complete the tree diagram to help solve the problem.]



Pr(SS) = 0.1

Pr(SA) = ...

Pr(....) = ...

Pr(....) = ...

32. [Problem Solving 1] *

A long strip of paper was folded in half then in half again. It then had three crease lines in the strip. If the paper was folded in half eight more times (ten altogether), how many creases would there be when it was unfolded?

[Note: When unfolded all the crease lines should be parallel to each other.]

33. [Problem Solving 2] *

If a, b and c represent the side lengths of a triangle and $\sqrt{2(a+b)} = \sqrt{a+c} + \sqrt{a-c}$, what type of triangle is it?

MATHS MATE

Term 3 - Sheet 4

Name: .....

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

Parent's Signature: .....

1. [Long ×,÷]

$33.05 \div 5 =$

2. [Decimal +,–] *

$x - 0.014 = 0.028$

$x =$

3. [Decimal ×,÷]

$40 \div x = 0.4$

$x =$

4. [Fraction +,–] *

$\frac{3}{4} + \frac{1}{6} - \frac{5}{12} =$

5. [Fraction ×,÷] *

$2 \div 2\frac{1}{8} =$

6. [Percentages] *

A seller decides to mark-up prices by 8%. What is the new price of an item that had been \$45?

\$

7. [Integer +,–] *

$(6 - 13) - (5 - 14) =$

8. [Integer ×,÷]

$\frac{-4m^2}{-2m} =$

9. [Rates / Ratios] *

The price of 1 kg of ivory increased by about US\$90 per year for the eight years to 2008 when it reached US\$1000. If it were to continue at this rate, what price did the ivory reach in 2020?

US\$ /kg

10. [Indices] *

Simplify and express using positive indices

$\frac{(2m^2)^{-1}}{6m^{-2}}$

11. [Square Roots / Surds] *

Evaluate $\frac{2\sqrt{6} \times 3\sqrt{3}}{\sqrt{50}}$

12. [Order of Operations] *

$8 \times 8 - (8 \div 8) =$

13. [Exploring Number] *

Write 0.035% as a fraction in simplest form.

14. [Scientific Notation]

Express 7.5×10^2 as a basic numeral.

15. [Number Patterns]

Write the first four terms of the sequence $t_n = n(n - 1)$ where $n \geq 1$

16. [Expressions]

Squashing 20 kilograms of oranges gives you 3 litres of juice. At this rate how much juice would you obtain from y kilograms of oranges?

L

17. [Substitution] *

For what values of x is $\frac{4}{(x-2)(x-3)}$ undefined?

18. [Expansion] *

Expand and simplify $y(y + 3)(y - 3)$

19. [Factorisation]

Factorise $6x^2 + 25x + 14$

20. [Equations] *

Solve for x: $x^2 - 6x = 0$

21. [Graphs & Functions]

Complete the table of values for the parabola of equation $y = -2x^2 - 3$

x	–3	–2	–1	0	1	2	3
y							

QUOTE OF THE WEEK: A crisis event often explodes the illusions that anchor our lives. Robert Veninga

22. [Units of Measurement / Time]

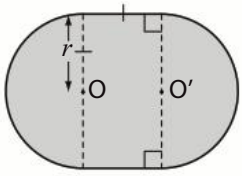
How many kilometres in d metres?

23. [Perimeter] *

Soccer fields must be between 45 and 90 metres wide and between 90 and 120 metres long. What is the value of the ratio $\frac{\text{maximum allowable perimeter}}{\text{minimum allowable perimeter}}$?

24. [Area] *

Write a formula for the area A of the shape.
[Leave your answer as a multiple of π.]



$A =$

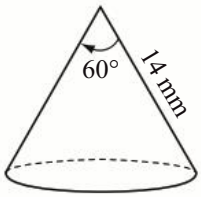
25. [Volume] *

Rain water from the flat roof of a building 11 m by 10 m flows into a cylindrical tank of diameter 2 m. Find the increase in the depth of water in the tank after 20 mm of rain.
(Use $\pi \approx \frac{22}{7}$)

mm

26. [Surface Area] *

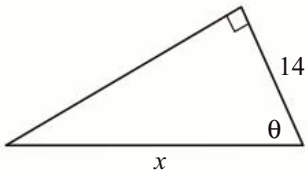
Using $\pi \approx \frac{22}{7}$ find the total surface area of the cone.



mm^2

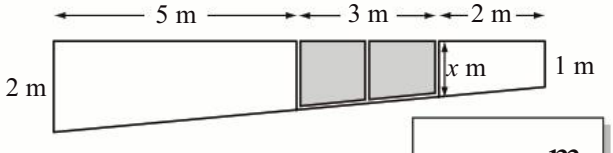
27. [Pythagoras / Trigonometry] *

Find the value of x, given $\cos\theta = 0.7$



28. [Shape / Location] *

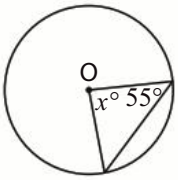
A fence is constructed on sloping ground as shown below. What is the height x of the fence to the right of the driveway?



m

29. [Angles] *

Find the value of $x°$.



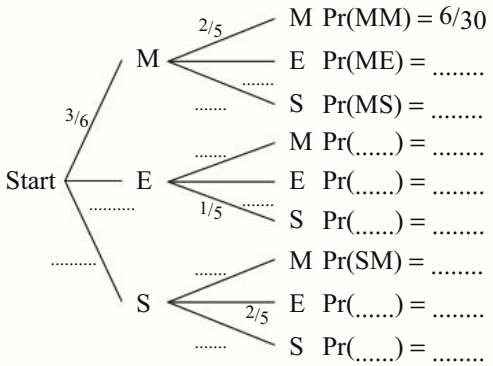
30. [Statistics]

The stemplot shows the home and away results of Collingwood and Fremantle over the 2010 AFL season. Find the difference between the medians of the two sets of data.

Collingwood				Fremantle					
		3	9						
	1	4							
4	0	5							
		6	7	9					
	6	7	6						
6	0	8	1	2	2	7			
6	5	9	3	3	6	7			
5	0	10	0						
	3	11	1	2	3	4	5	8	
7	3	0	12	5					
	3	13	9						
		14							
	5	15							
	2	16	0						

31. [Probability]

Two people are to represent the university at an international seminar. They are to be selected at random from a group made up of 3 medical students, 2 engineering students and 1 science student. What is the probability that two engineering students will be selected?
[Complete the tree diagram to help solve the problem.]



32. [Problem Solving 1] *

From 1986 to 1990 Coober Pedy's population fell 10%. From 1990 to 1994 it grew 10%, but the population was still 16 fewer than in 1986. What was the population of Coober Pedy in 1994?

33. [Problem Solving 2] *

Each letter stands for a different digit. What number does STATES represent?

$$\begin{array}{r} \text{ALASKA} \\ \text{KANSAS} \\ +\ \text{NEVADA} \\ \hline \text{STATES} \end{array}$$

MATHS MATE

Term 3 - Sheet 5

Name: .....

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

Parent's Signature: .....

1. [Long ×,÷] *

$19 \times 1.8 =$

2. [Decimal +,–] *

$1 - x = 0.125$

$x =$

3. [Decimal ×,÷]

$0.07 \div x = 7$

$x =$

4. [Fraction +,–] *

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

5. [Fraction ×,÷] *

$\frac{xy}{2y} \times \frac{10}{5x} =$

6. [Percentages] *

Nicola does 40% of her homework before dinner. Of the rest, she does 60% after dinner. What percentage does she leave until morning?

7. [Integer +,–]

$(+14) - (+4) + (-12) =$

8. [Integer ×,÷]

$(-3) \times (-8) \div (-2) =$

9. [Rates / Ratios] *

The Sun is 73% hydrogen, 25% helium and 2% other elements. How much helium would there be in 1 kilogram of matter from the Sun?

g

10. [Indices]

Given $2^x = 64$, find the value of x.

11. [Square Roots / Surds] *

Rationalise and simplify $\frac{14}{\sqrt{2}}$

12. [Order of Operations] *

$12 \div 4 \times (12 - 6) =$

13. [Exploring Number] *

Place in descending order:

$3 , 2^2 , \sqrt{23}$

14. [Scientific Notation] *

Evaluate and express as a basic numeral

$(5.4 \times 10^{-2}) \times (2 \times 10^{3})$

15. [Number Patterns]

Find the rule of the sequence t_n where $n \geq 1$

2, 4, 6, 8, 10, ...

$t_n =$

16. [Expressions]

If n is an integer, which of the following must be an odd number?

$n + 1 , 3(n + 1) , 2n + 1 , 2n$

17. [Substitution] *

Does the ordered pair (3.5,6) satisfy the relation $x^2 > 2y$?

18. [Expansion] *

Expand and simplify

$(x + 2)(x - 5) + 2x(x - 3)$

19. [Factorisation] *

Factorise and simplify

$\frac{x^2 + 2x + 1}{x^2 - 1}$

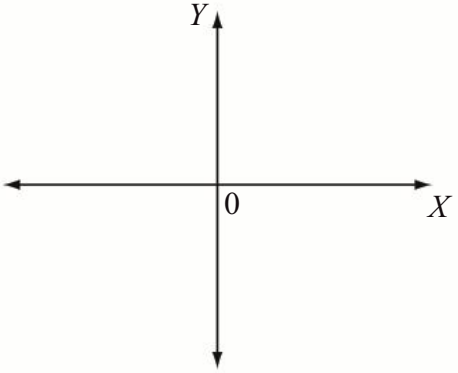
20. [Equations] *

Solve for x:

$x^2 - 49 = 0$

21. [Graphs & Functions]

Sketch the parabola of equation $y = -2x^2$ without plotting points.



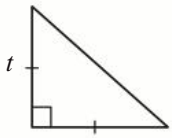
QUOTE OF THE WEEK: People who think they know everything are a great annoyance to those of us who do.

22. [Units of Measurement / Time] *

The earth is travelling around the sun at an average speed of 30 km/s. Express this speed in km/h.

23. [Perimeter] *

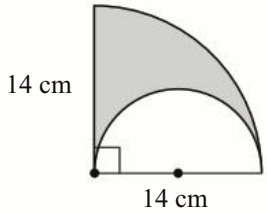
Write a formula for the perimeter P of the triangle.



$P =$

24. [Area] *

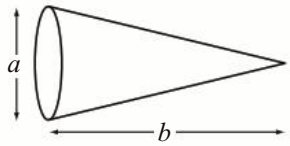
Using $\pi \approx \frac{22}{7}$ find the shaded area.



cm^2

25. [Volume] *

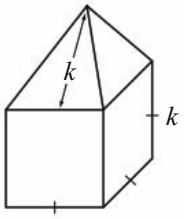
Write a simple formula for the volume V of the cone in terms of a, b and π.



$V =$

26. [Surface Area] *

Write a formula for the total surface area (TSA) of the solid which has the shape of a square pyramid on top of a cube.



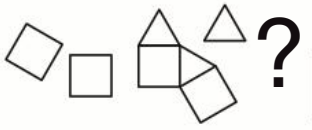
$TSA =$

27. [Pythagoras / Trigonometry] *

Find the distance between the points A(−2,−2) and B(3,−1). [Express your answer in surd form.]

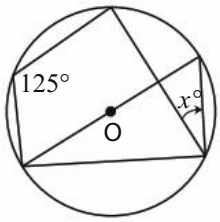
28. [Shape / Location]

I have four squares and three triangles all of which have side lengths of 5 cm. I attempt to form a net for a polyhedron by taping the shapes together along their edges. If this can be done, into what shape will the net fold?



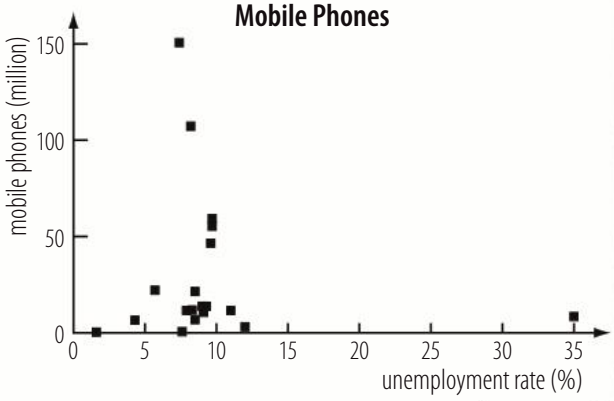
29. [Angles] *

Find the value of $x°$.



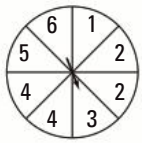
30. [Statistics]

How many of the selected countries have less than 10 million mobile phones and more than a 30% unemployment rate?



31. [Probability]

How many times would you expect to spin an odd number if the spinner is spun 40 times?



32. [Problem Solving 1] *

Leonardo Fibonacci posed the following problem in the 13th century:

"A peasant bought 30 birds with 30 coins. For every 5 partridges he paid 3 coins, for every pigeon he paid 2 coins and for every pair of sparrows 1 coin. How many pigeons did he buy?"

33. [Problem Solving 2] *

Radius Plus tyres last 60 000 kilometres when used on the back of my car, but only 40 000 kilometres when used on the front of my car. What is the greatest distance I can travel on one set of tyres if they are interchanged at the appropriate time?

km

MATHS MATE

Term 3 - Sheet 6

Name: .....

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

Parent's Signature: .....

1. [Long ×,÷]

$19.62 \div 6 =$

2. [Decimal +,–] *

$1 - x = 0.0465$

$x =$

3. [Decimal ×,÷]

$x \times 0.8 = 8$

$x =$

4. [Fraction +,–] *

$\frac{y-1}{3} + \frac{y+2}{6} =$

5. [Fraction ×,÷] *

$\frac{4}{3x} \div \frac{xy}{9x} =$

6. [Percentages] *

A group of hikers are on a 40 km trip. On the first day they completed 40% of the trip. On the second day 25% of the remaining distance was covered. How many kilometres were left to walk?

7. [Integer +,–]

$(-2x) - (+5x) + (-4x) =$

8. [Integer ×,÷]

$(+5) \times (-7) \times (-2) =$

9. [Rates / Ratios] *

Water is a combination of hydrogen and oxygen in the ratio 1 : 8 by weight. How much oxygen is there in 162 grams of water?

g

10. [Indices] *

Given $2^x = \frac{1}{4}$, find the value of x.

11. [Square Roots / Surds] *

Rationalise and simplify $\frac{12}{\sqrt{3}}$

12. [Order of Operations]

$(4^{100} \div 23)^0 =$

13. [Exploring Number] *

Place in ascending order:

3^2 , $\sqrt{71}$, 2^3

14. [Scientific Notation] *

Evaluate and express as a basic numeral

$(6 \times 10^2) \times (1.5 \times 10^{-4})$

15. [Number Patterns]

Find the rule of the sequence t_n where $n \geq 1$

3, 4, 5, 6, 7, ...

$t_n =$

16. [Expressions]

If n is a negative integer, which of the following must be positive?

$n + 1$, $2n$, n^2 , n^5

17. [Substitution] *

Does the ordered pair (–7,–4) satisfy the relation $4x = 7y$?

18. [Expansion] *

Expand and simplify

$3x(5x - 2) - (x + 1)^2$

19. [Factorisation] *

Factorise and simplify

$\frac{x^2 - 9}{x^2 + 4x + 3}$

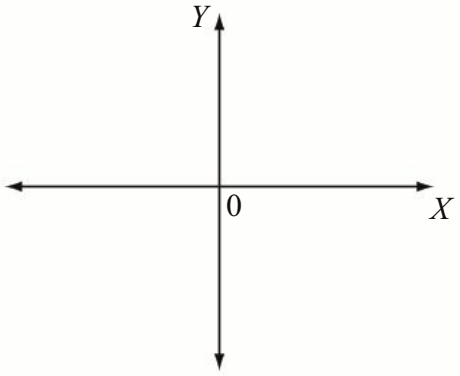
20. [Equations] *

Solve for x:

$4(x^2 - 4) = 0$

21. [Graphs & Functions]

Sketch the parabola of equation $y = 4x^2$ without plotting points.



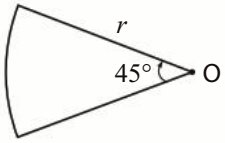
QUOTE OF THE WEEK: Before enlightenment: chopping wood, carrying water. After enlightenment: chopping wood, carrying water.

22. [Units of Measurement / Time] *

A zebra can run at up to 18 m/s, while a red deer can reach 78 km/h. Which animal is faster?

23. [Perimeter] *

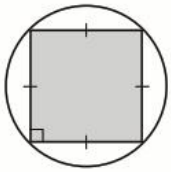
Write a formula for the perimeter P of the shape.



$P =$

24. [Area] *

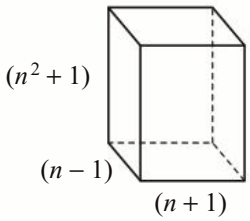
The area of the circle is 16π m^2. Find the area of the square inside the circle.



m^2

25. [Volume] *

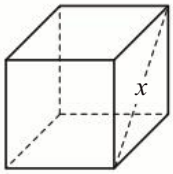
Write a simple formula for the volume V of the rectangular prism.



$V =$

26. [Surface Area] *

Write a formula for the total surface area TSA of the cube.



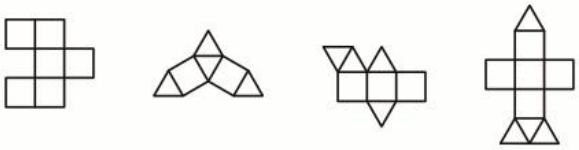
$TSA =$

27. [Pythagoras / Trigonometry] *

A triangle has sides of lengths 3 cm, 5 cm and $\sqrt{35}$ cm. Is it a right-angled triangle?

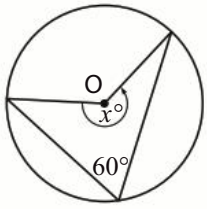
28. [Shape / Location]

Circle the two nets that **can** be folded to form a model of a polyhedron.



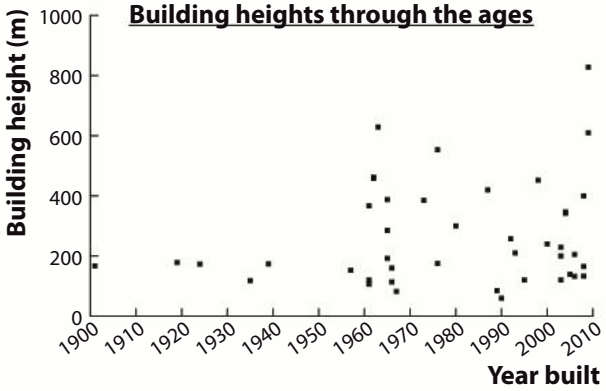
29. [Angles] *

Find the value of $x°$.



30. [Statistics]

In which decade did the first building exceed 500 metres high?



31. [Probability]

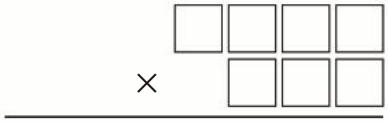
The probability that a match box contains exactly 50 matches is $\frac{2}{5}$. If 15 boxes of matches are investigated, how many would you expect to find with exactly 50 matches inside?

32. [Problem Solving 1] *

Two groups of young people each contains 10 men. In one group the ratio of women to men is 1 : 2 but in the other it is 2 : 1. If the two groups combine, what will the new ratio be?

33. [Problem Solving 2] *

Use the digits 1, 2, 3, 4, 5, 6 and 7 (once each) to complete this multiplication so that the answer is as large as possible.



MATHS MATE

Term 3 - Sheet 7

Name: .....

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

Parent's Signature: .....

1. [Long ×,÷]

$29.7 \div 3 =$

2. [Decimal +,–] *

$1 - x = 0.006$

$x =$

3. [Decimal ×,÷]

$2.4 \div x = 240$

$x =$

4. [Fraction +,–] *

$\frac{2w+1}{8} - \frac{w}{4} =$

5. [Fraction ×,÷] *

$\frac{2xy}{5} \times \frac{10}{4y} =$

6. [Percentages] *

Girls make up 56% of a class. How many students are there in the class if there are 3 more girls than boys?

7. [Integer +,–]

$(+2) + (-5) + (-20) =$

8. [Integer ×,÷]

$(-6) \times (-5) \times (+5) =$

9. [Rates / Ratios] *

Silicone rubber contains carbon, hydrogen, oxygen and silicone atoms in the ratio 2 : 6 : 1 : 1. What percentage of the atoms in silicone rubber are actually silicone atoms?

10. [Indices] *

If $2^x = 0.25$, what is the value of x?

11. [Square Roots / Surds] *

Rationalise and simplify $\frac{3}{2\sqrt{6}}$

12. [Order of Operations]

$(4 + 3 \times 2)^6 =$

13. [Exploring Number] *

Place in descending order:

$1.45\ ,\ \sqrt{2.25}\ ,\ \left(\frac{6}{5}\right)^2$

14. [Scientific Notation] *

Evaluate and express in scientific notation

$(0.04 \times 10^{-2}) \times (0.5 \times 10^{-2})$

15. [Number Patterns]

Find the rule of the sequence t_n where $n \geq 1$

5, 10, 15, 20, 25, ...

$t_n =$

16. [Expressions]

If $3n$ is an even number, which of the following must be an odd number?

$n\ ,\ n^2\ ,\ n+1\ ,\ n+2$

17. [Substitution] *

Does the ordered pair (7,5) satisfy the relation $2x > 3y$?

18. [Expansion] *

Expand and simplify

$(x-2)(x+3) - (x-5)(x-1)$

19. [Factorisation] *

Factorise and simplify

$\frac{x^2 - x - 2}{x^2 + x - 6}$

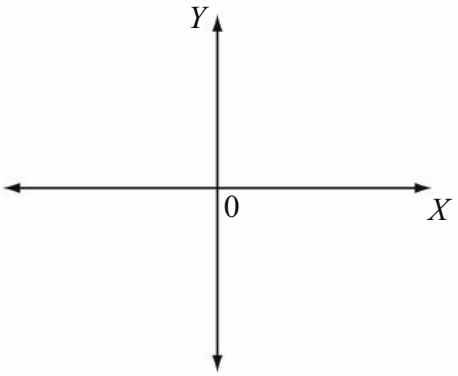
20. [Equations] *

Solve for x:

$x(x^2 - 1) = 0$

21. [Graphs & Functions]

Sketch the parabola of equation $y = -x^2 + 1$ without plotting points.



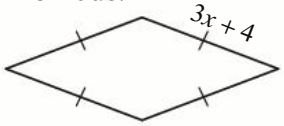
QUOTE OF THE WEEK: Imagination encircles the world. Albert Einstein

22. [Units of Measurement / Time] *

The strongest wind gust recorded on the Australian mainland is 267 km/h, during cyclone Vance, in 1999 in Western Australia. Express this speed in m/s.
[Round to the nearest whole number.]

23. [Perimeter] *

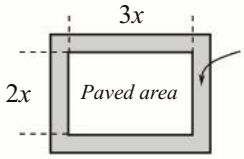
Find the formula for the perimeter P of the rhombus.



$P =$

24. [Area] *

A rectangular paved area has side lengths in the ratio 3 : 2. If the paving is surrounded by a 3 metre wide strip of lawn, find the paved area given that it is exactly equal to the grassed area around it.

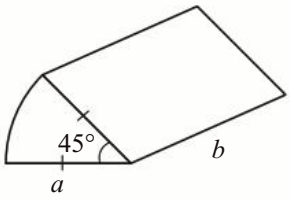


3 m wide grassed area

m^2

25. [Volume] *

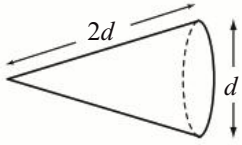
Write a simple formula for the volume V of the solid in terms of a, b and π.



$V =$

26. [Surface Area] *

Write a formula for the total surface area TSA of the cone. [Leave your answer as a multiple of π.]



$TSA =$

27. [Pythagoras / Trigonometry] *

A ship sails 12 km due east then 16 km due north. How far is it now from where it started?

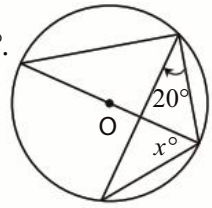
km

28. [Shape / Location]

I have three squares and four triangles all of which have side lengths of 2 cm. I attempt to form a net for a polyhedron by taping the shapes together along their edges. If this can be done, into what shape will the net fold?

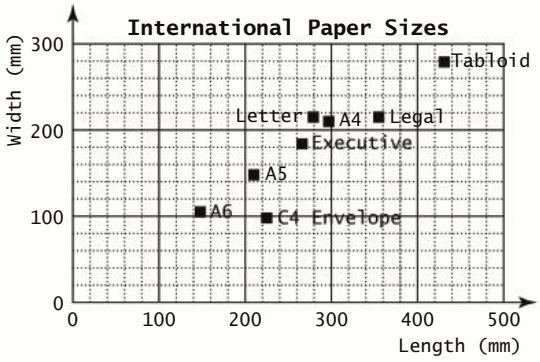
29. [Angles] *

Find the value of $x°$.



30. [Statistics]

Which of the paper sizes shown is the closest to being square?



31. [Probability]

The probability that a person is unemployed is 6%. If 300 people were surveyed, how many would you expect to be unemployed?

32. [Problem Solving 1] *

Ocean water is 5% salt. How many litres of pure water have to be added to 4 L of ocean water to reduce the concentration of salt to 2%?

33. [Problem Solving 2] *

Traditionally, billiard tables are measured in imperial measurements called feet. A manufacturer made a rectangular table that measured 6 feet by 8 feet from cushion to cushion. A ball was struck on this table so that it rebounded off all four sides and returned exactly to its original position. Find the total distance travelled by the ball.

MATHS MATE

Term 3 - Sheet 8

Name: .....

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

Parent's Signature: .....

1. [Long ×,÷]

$21.05 \div 5 =$

2. [Decimal +,−] *

$1 - x = 0.021$

$x =$

3. [Decimal ×,÷]

$0.2 \div x = 0.02$

$x =$

4. [Fraction +,−] *

$\frac{z}{5} + \frac{3z+5}{10} =$

5. [Fraction ×,÷] *

$\frac{5xy}{2} \div \frac{y}{4x} =$

6. [Percentages] *

For a science test Joseph received two more marks, which gave him a 4% higher grade than Dylan. What were the possible marks attainable in the test?

7. [Integer +,−]

$(-2y) - (-7y) - (+5y) =$

8. [Integer ×,÷]

$(-10) \times (-6) \div (-5) =$

9. [Rates / Ratios] *

The longest bone in the body is the femur which is likely to be 50 cm long in a person 1.8 m tall. If a person has a femur 40 cm long, how tall would you expect that person to be?

m

10. [Indices] *

If $10^x = 0.1$, what is the value of x?

11. [Square Roots / Surds] *

Rationalise and simplify $\frac{6}{5\sqrt{3}}$

12. [Orders of Operations] *

$3 \times 48 \div 12 =$

13. [Exploring Number] *

Place in ascending order:

$1.42\ ,\ \sqrt{2}\ ,\ \left(1\frac{1}{5}\right)^2$

14. [Scientific Notation] *

Evaluate and express in scientific notation

$(2.4 \times 10^{-2}) \times (4 \times 10^{-4})$

15. [Number Patterns]

Find the rule of the sequence t_n where $n \geq 1$

14, 11, 8, 5, ...

$t_n =$

16. [Expressions]

If n is any integer, which of the following is always odd?

$n-1\ ,\ n+1\ ,\ n+2\ ,\ 2n+1$

17. [Substitution] *

Does the ordered pair $(\frac{3}{4}, \frac{1}{5})$ satisfy the relation $x + y > 1$?

18. [Expansion] *

Expand and simplify

$3(x+4)(x-2) - (x^2 - 1)$

19. [Factorisation] *

Factorise and simplify

$\frac{x^2 - 8x + 12}{3x^3 - 12x}$

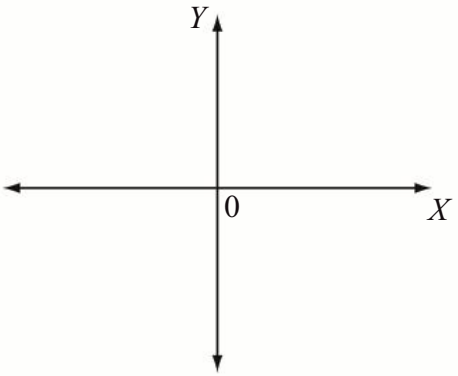
20. [Equations] *

Solve for x:

$x(9 - x^2) = 0$

21. [Graphs & Functions] *

Sketch the parabola of equation $y = -x^2 + 2$ without plotting points.



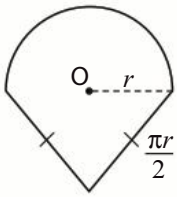
QUOTE OF THE WEEK: Man cannot discover new oceans until he has courage to lose sight of the shore.

22. [Units of Measurement / Time] *

The strongest wind recorded in Antarctica reached a speed of 327 km/h. Express this speed in m/s. [Round to the nearest whole number.]

23. [Perimeter] *

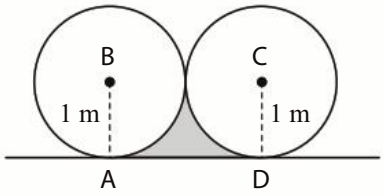
Write a formula for the perimeter P of the shape.



$P =$

24. [Area] *

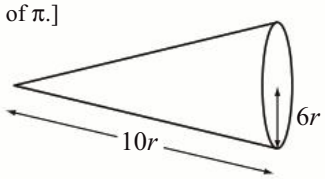
Using $\pi \approx 3.14$ find the shaded area.



m^2

25. [Volume] *

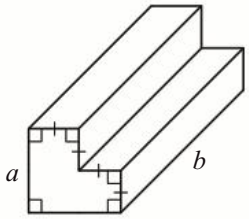
Write a simple formula for the volume V of the cone in terms of r. [Express your answer as a multiple of π.]



$V =$

26. [Surface Area] *

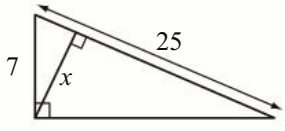
Write a formula for the total surface area TSA of the solid.



$TSA =$

27. [Pythagoras / Trigonometry] *

Calculate the unknown marked length.

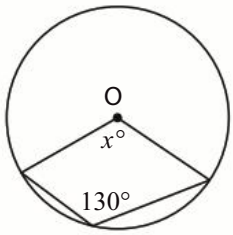


28. [Shape / Location]

Circle the net that **can** be folded to form a model of a polyhedron.

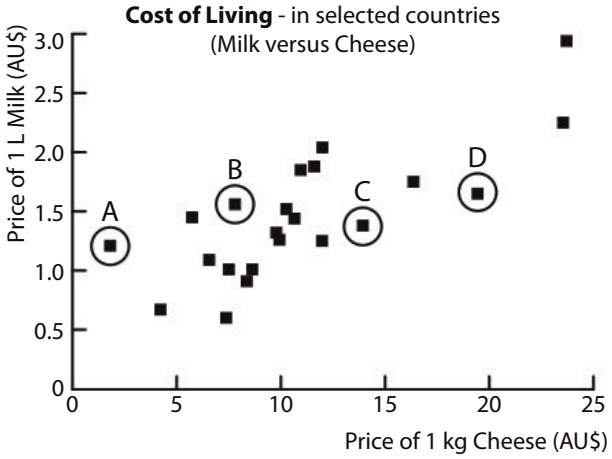
29. [Angles] *

Find the value of $x°$.



30. [Statistics]

Which circled country has a ratio of the price of cheese to milk closest to 5 : 1?



31. [Probability]

How many times would you expect heads to come up when a fair coin is tossed 50 times?

32. [Problem Solving 1] *

A small Middle Eastern town has a population of 10 000 people. Some of these people are one-legged and wear only one sandal. Of the rest of the population, exactly half go barefoot. How many sandals are worn in the town?

33. [Problem Solving 2] *

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

A	×	C	= EC
A	×	E	= IE
A	×	A	= FA
A	×	F	= JC
A	×	I	= JI
A	×	J	= A
A	×	B	= EI
A	×	G	= DE
A	×	D	= FH

MATHS MATE

Name: .....

Class: .....

Teacher: .....

Worksheet Results

Term 4

		Sheet 1	Sheet 2	Sheet 3	Sheet 4	Sheet 5	Sheet 6	Sheet 7	Sheet 8
NUMBER & ALGEBRA	1. [Long ×,÷]	1	1	1	1	1	1	1	1
	2. [Decimal +,–]	2	2	2	2	2	2	2	2
	3. [Decimal ×,÷]	3	3	3	3	3	3	3	3
	4. [Fraction +,–]	4	4	4	4	4	4	4	4
	5. [Fraction ×,÷]	5	5	5	5	5	5	5	5
	6. [Percentages]	6	6	6	6	6	6	6	6
	7. [Integer +,–]	7	7	7	7	7	7	7	7
	8. [Integer ×,÷]	8	8	8	8	8	8	8	8
	9. [Rates / Ratios]	9	9	9	9	9	9	9	9
	10. [Indices]	10	10	10	10	10	10	10	10
	11. [Square Roots / Surds]	11	11	11	11	11	11	11	11
	12. [Order of Operations]	12	12	12	12	12	12	12	12
	13. [Exploring Number]	13	13	13	13	13	13	13	13
	14. [Scientific Notation]	14	14	14	14	14	14	14	14
	15. [Number Patterns]	15	15	15	15	15	15	15	15
	16. [Expressions]	16	16	16	16	16	16	16	16
	17. [Substitution]	17	17	17	17	17	17	17	17
	18. [Expansion]	18	18	18	18	18	18	18	18
	19. [Factorisation]	19	19	19	19	19	19	19	19
	20. [Equations]	20	20	20	20	20	20	20	20
	21. [Graphs & Functions]	21	21	21	21	21	21	21	21
MEASUREMENT & GEOMETRY	22. [Units of Measurement / Time]	22	22	22	22	22	22	22	22
	23. [Perimeter]	23	23	23	23	23	23	23	23
	24. [Area]	24	24	24	24	24	24	24	24
	25. [Volume]	25	25	25	25	25	25	25	25
	26. [Surface Area]	26	26	26	26	26	26	26	26
	27. [Pythagoras / Trigonometry]	27	27	27	27	27	27	27	27
	28. [Shape / Location]	28	28	28	28	28	28	28	28
	29. [Angles]	29	29	29	29	29	29	29	29
STATISTICS & PROBABILITY	30. [Statistics]	30	30	30	30	30	30	30	30
	31. [Probability]	31	31	31	31	31	31	31	31
PROBLEM SOLVING	32. [Problem Solving 1]	32	32	32	32	32	32	32	32
	33. [Problem Solving 2]	33	33	33	33	33	33	33	33
	Total Correct								

MATHS MATE

Term 4 - Sheet 1

Name: .....

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

Parent's Signature: .....

1. [Long ×,÷] *

$23.5 \times 17 =$

2. [Decimal +,–] *

$12.2 - x = 6.5$

$x =$

3. [Decimal ×,÷]

$x^2 = 0.01$

$x =$

4. [Fraction +,–] *

$$\frac{x+2}{3} + \frac{x+5}{4} =$$

5. [Fraction ×,÷] *

$$\frac{2}{x+3} \times \frac{x+3}{5} =$$

6. [Percentages] *

$1000 has been invested for 2 years at 6% per annum compound interest. Find the interest which has accrued.

$

7. [Integer +,–] *

$-6x - (2x - 10x) =$

8. [Integer ×,÷] *

$$\frac{4-3}{3-4} =$$

9. [Rates / Ratios] *

Human kidneys filter the blood about 300 times a day. At this rate how many times is the blood filtered each hour?

times/h

10. [Indices] *

Simplify $\dfrac{3m^2 r \times (2r)^{-3}}{m^3 r^{-2}}$

11. [Square Roots / Surds] *

Expand and simplify

$(3+2\sqrt{7})(3-2\sqrt{7})$

12. [Order of Operations] *

$(10-9)^{2010} \times (6-6)^{2014} =$

13. [Exploring Number] *

$\sqrt{12} < 3\frac{1}{2}$ True or false?

14. [Scientific Notation] *

Evaluate and express in scientific notation

$(4 \times 10^{-2})^2$

15. [Number Patterns]

Find the rule of the sequence t_n where $n \geq 1$

3, 5, 7, 9, 11, ...

$t_n =$

16. [Expressions] *

Simplify the polynomial subtraction:

$(8x^3 + 4x^2 - x + 3) - (6x^3 + 2x)$

17. [Substitution] *

If $v = u + at$, find the speed v (in m/s) if $u = 2$ m/s, $a = 3$ m/s^2 and $t = 5$ s.

18. [Expansion] *

Expand and simplify $(a+b+c)^2$

19. [Factorisation] *

Factorise

$9x^3 - x$

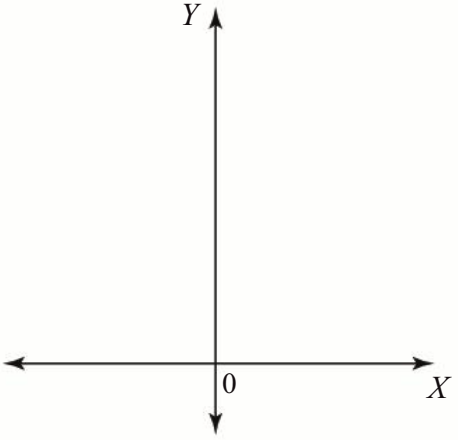
20. [Equations] *

Solve the inequality:

$x^2 + 6x + 5 < 0$

21. [Graphs & Functions] *

Sketch the graph of equation $y = x^2 + 1$ labelling the intercepts, axis of symmetry and turning point.



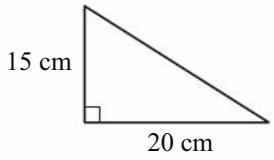
QUOTE OF THE WEEK: I figured that if I said it enough, I would convince the world that I really was the greatest. Muhammad Ali

22. [Units of Measurement / Time]

How many hectares in a square kilometre?

23. [Perimeter] *

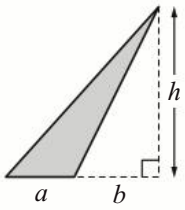
Find the perimeter of the triangle.
[Hint: Pythagoras' theorem will help.]



cm

24. [Area] *

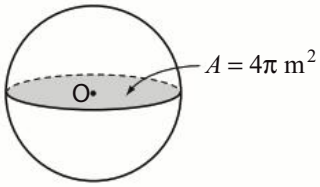
Write a simple formula for the area A of the shaded triangle.



$A =$

25. [Volume] *

Find the volume of the sphere. [Express your answer as a multiple of π.]



$V =$

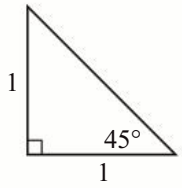
26. [Surface Area] *

In which cube is the ratio $\frac{\text{surface area}}{\text{volume}}$ greater?

A) a smaller cube
B) a larger cube

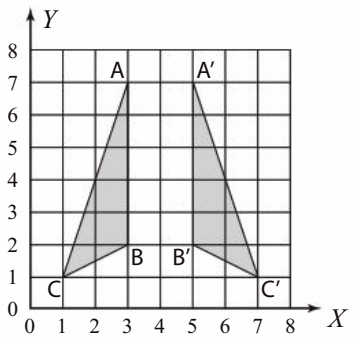
27. [Pythagoras / Trigonometry] *

Use the triangle to find the value of sin 45°.
[Leave your answer in surd form.]



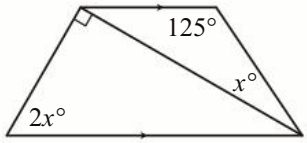
28. [Shape / Location]

Name and describe the transformation which moved the triangle ABC to its new position A'B'C'.



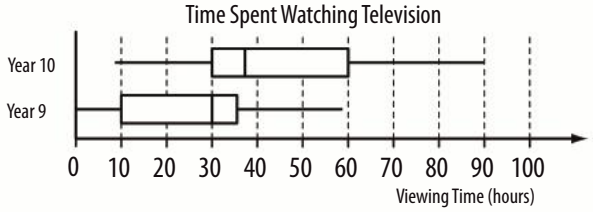
29. [Angles] *

Find the value of $x°$.



30. [Statistics]

The box-and-whisker plots show a comparison of the time spent watching television by students in a Year 9 and a Year 10 class over a month. Estimate the ranges for both sets of data, by rounding off to the nearest ten.



Yr 9 range = Yr 10 range =

31. [Probability] *

In how many different ways can four books, A, B, C and D, be placed side by side on a bookshelf? [Note: ABCD and ABDC are 2 examples.]

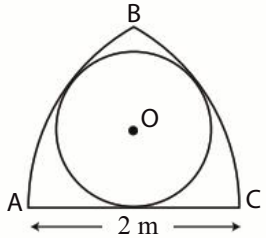
32. [Problem Solving 1] *

The number 85 can be expressed as a sum of two or more consecutive, positive integers in three different ways. One such sequence begins with 15.
i.e. 15 + 16 + 17 + 18 + 19 = 85

With which numbers do the other two sequences begin?

33. [Problem Solving 2] *

In the diagram, the arc AB is centred at C and the arc BC is centred at A. What is the radius of the circle centred at O?



m

MATHS MATE

Term 4 - Sheet 2

Name: .....

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

Parent's Signature: .....

1. [Long ×,÷] *

$15.9 \times 13 =$

2. [Decimal +,–] *

$6.117 - x = 4$

$x =$

3. [Decimal ×,÷]

$\sqrt{x} = 0.01$

$x =$

4. [Fraction +,–] *

$\frac{y+1}{2} + \frac{y-2}{5} =$

5. [Fraction ×,÷] *

$\frac{7}{h+7} \div \frac{h}{h+7} =$

6. [Percentages] *

The population of a country is 8 000 000. If the population is forecast to grow at a rate of 5% per annum, what will the population be in 3 years time?

7. [Integer +,–] *

$7w - (2w - 9w) =$

8. [Integer ×,÷] *

$\frac{5-9}{5-9} =$

9. [Rates / Ratios] *

How much petrol is required for a trip from Brisbane to Toowoomba, a distance of 128 km, if your car's fuel consumption is 8 L/100 km?

L

10. [Indices] *

Simplify $\frac{4bc \times c^3}{(2c^{-2})^{-3}}$

11. [Square Roots / Surds] *

Expand and simplify

$(\sqrt{3} + 3\sqrt{5})(\sqrt{3} + \sqrt{5})$

12. [Order of Operations] *

$24 \times 51 \times (7 - 7) + 19 =$

13. [Exploring Number] *

$\sqrt{43} > 6\frac{1}{2}$ True or false?

14. [Scientific Notation] *

Evaluate and express in scientific notation

$(9 \times 10^{-5})^2$

15. [Number Patterns]

Find the rule of the sequence t_n where $n \geq 1$

1, 4, 9, 16, ...

$t_n =$

16. [Expressions] *

Add the following polynomials:

$(3x^3 - x^2 + 2x + 5) + (2x^2 - 3)$

17. [Substitution] *

If $x = ut + \frac{1}{2}at^2$, find the distance x when $u = 15$ m/s, $a = 2$ m/s^2 and $t = 15$ s.

m

18. [Expansion] *

Expand and simplify $(2a + b + c)^2$

19. [Factorisation] *

Factorise

$2x^2 - 18y^2$

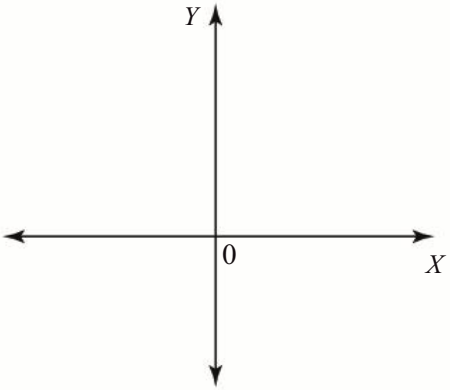
20. [Equations] *

Solve the inequality:

$x^2 - 6x - 7 < 0$

21. [Graphs & Functions] *

Sketch the graph of equation $y = x^2 - 1$ labelling the intercepts, axis of symmetry and turning point.



QUOTE OF THE WEEK: We are all Generals. Whatever action we take may influence the course of civilisation. Scott Peck

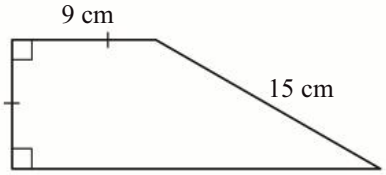
22. [Units of Measurement / Time] *

How many metres per second are equivalent to s km/h?

23. [Perimeter] *

Find the perimeter of the trapezium.

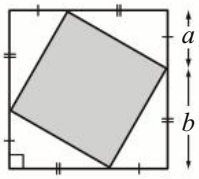
[Hint: Pythagoras' theorem will help.]



cm

24. [Area] *

Write a simple formula for the area A of the shaded square.



$A =$

25. [Volume] *

The radii of three spheres are 3 m, 4 m and 5 m respectively. Find the radius of a fourth sphere which has a volume equal to the sum of the volumes of the three smaller spheres.

m

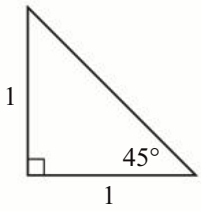
26. [Surface Area] *

The volume of cube A is 8 times that of cube B. Find the value of the ratio:

$$\frac{\text{surface area of A}}{\text{surface area of B}}$$

27. [Pythagoras / Trigonometry] *

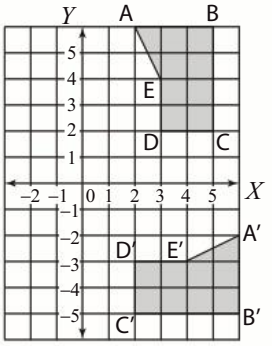
Use the triangle to find the value of tan 45°.



28. [Shape / Location]

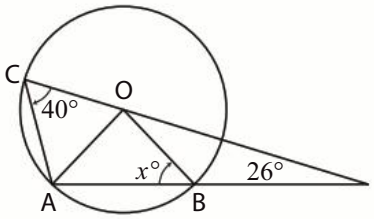
The rotation of the pentagon ABCDE about the origin to a new position A'B'C'D'E' is shown. How is the rotation best described?

A) 45° anticlockwise
B) 90° clockwise
C) 45° clockwise
D) 90° anticlockwise



29. [Angles] *

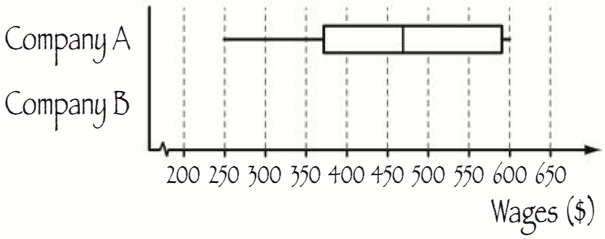
Find the value of x°.



30. [Statistics]

A boxplot of the weekly wages of the employees of company A is shown. Draw a boxplot for the weekly wages of company B.

Company A	$250	$300	$370	$400	$460	$480	$520	$590	$590	$600
Company B	$200	$230	$300	$330	$350	$450	$470	$600	$620	$620



31. [Probability] *

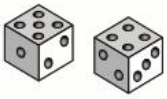
How many different 3-letter number plates can be formed using A, B, and C, if each letter can be used repeatedly?

[Note: ABA is one example.]

32. [Problem Solving 1]

Two different views are shown of a pair of identical dice, each numbered 1 to 6. Which number is opposite the number 1?

[Note: Though identical, the dice are not necessarily standard in that opposite sides may not add to 7.]



33. [Problem Solving 2]

Grandma had to cook her biscuits for exactly 10 minutes. However, the only timers she had were a 4 minute egg timer and a 7 minute egg timer. How did she use the two egg timers to measure exactly 10 minutes?

MATHS MATE

Term 4 - Sheet 3

Name: .....

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

Parent's Signature: .....

1. [Long ×,÷]

$12.84 \div 4 =$

2. [Decimal +,–] *

$30.6 - x = 14.55$

$x =$

3. [Decimal ×,÷]

$x^2 = 0.0009$

$x =$

4. [Fraction +,–] *

$\frac{z-2}{3} - \frac{z}{5} =$

5. [Fraction ×,÷] *

$\frac{5t}{t+1} \div \frac{1}{t+1} =$

6. [Percentages] *

Amos invests $20 000 at 10% per annum compound interest. What will Amos' investment be worth after 3 years?

$

7. [Integer +,–] *

$5y - (3y - 7y) =$

8. [Integer ×,÷] *

$\frac{-3}{-6} \times \frac{-12}{-4} =$

9. [Rates / Ratios] *

The annual average flow over Niagara Falls is 5640 m^3/s. Express this flow in megalitres per minute.

10. [Indices] *

Simplify $\frac{(2a^2b)^{-3}}{3ab \times 2a^{-3}}$

11. [Square Roots / Surds] *

Expand and simplify

$(2+\sqrt{5})(2+3\sqrt{5})$

12. [Order of Operations] *

$(5-5)^9 - (1999 \times 8)^0 =$

13. [Exploring Number]

$\frac{58}{60} > \frac{59}{61}$ True or false?

14. [Scientific Notation] *

Evaluate and express in scientific notation

$(3 \times 10^4)^3$

15. [Number Patterns]

Find the rule of the sequence t_n where $n \geq 1$

6, 10, 14, 18, 22, ...

$t_n =$

16. [Expressions]

Add the following polynomials:

$(2x^3 + x^2 - 3x - 6) + (3x^3 - 4x^2 + 2x)$

17. [Substitution] *

If $x = ut + \frac{1}{2}at^2$, find the distance x when $u = 300$ m/s, $a = 5$ m/s^2 and $t = 60$ s.

m

18. [Expansion] *

Expand and simplify $(x + 2y + 3z)^2$

19. [Factorisation] *

Factorise $2a^2bc - 4ab + 6ac$

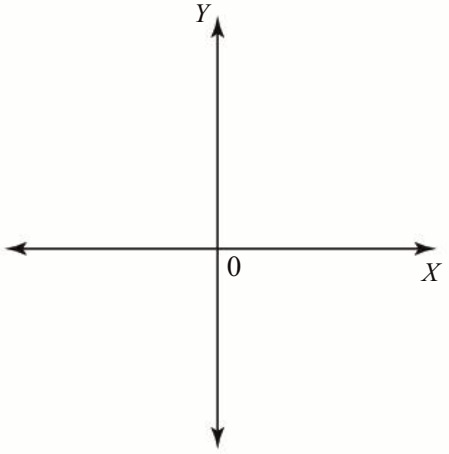
20. [Equations] *

Solve the inequality:

$x^2 - 2x - 8 \geq 0$

21. [Graphs & Functions] *

Sketch the graph of equation $y = 2x^2$ labelling the intercepts, axis of symmetry and turning point.



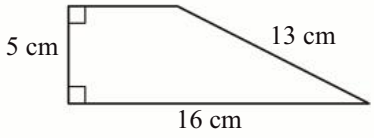
QUOTE OF THE WEEK: The ultimate result of shielding men from the effects of folly, is to fill the world with fools. Herbert Spencer

22. [Units of Measurement / Time] *

How many grams/cm^3 are equivalent to d tonnes/m^3?

23. [Perimeter] *

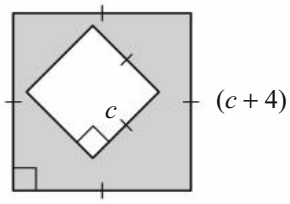
Find the perimeter of the trapezium.
[Hint: Pythagoras' theorem will help.]



cm

24. [Area] *

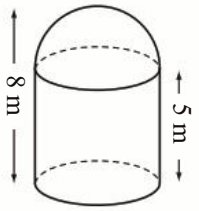
Write a simple expression for the area A of the shaded region.



$A =$

25. [Volume] *

This solid has the shape of a hemisphere on a cylinder. Find its volume expressed as a multiple of π.



m^3

26. [Surface Area] *

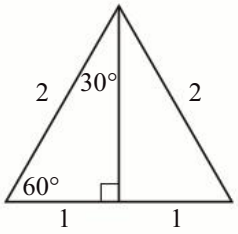
Find the value of the ratio:

$$\frac{\text{total surface area of cylinder}}{\text{surface area of sphere}}$$

where the cylinder is just able to contain the sphere.

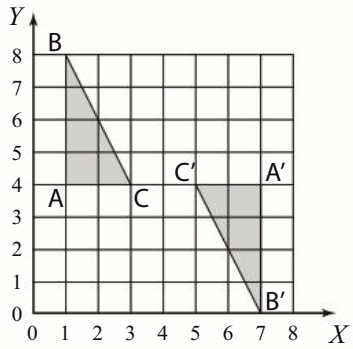
27. [Pythagoras / Trigonometry] *

Use the triangle shown to find the value of cos 30°. [Leave your answer in surd form.]



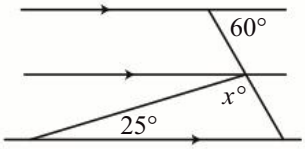
28. [Shape / Location]

Name and describe the transformation which moved the triangle ABC to its new position A'B'C'.



29. [Angles] *

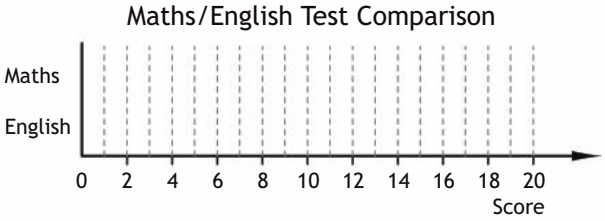
Find the value of x°.



30. [Statistics]

Maths and English test results for a class of 20 students are shown below. Draw two comparative boxplots to illustrate the data.

Maths	5	7	8	8	9	10	10	12	13	14
	14	15	16	16	16	18	18	19	20	20
English	5	6	6	7	11	11	12	13	13	14
	15	15	17	17	18	19	19	20	20	20



31. [Probability] *

In how many different ways can four blocks, A, B, C and D, be stacked directly on top of each other if block A has to be on the bottom?

32. [Problem Solving 1] *

When asked about the ability of her cats to catch rats, Miss Kitty replied,
"On average, we find a cat-and-a-quarter can catch a rat-and-a-quarter in a minute-and-a-quarter."
How many rats could ten of these cats catch in ten minutes?

33. [Problem Solving 2] *

A pattern of triangles is made from toothpicks, as shown below. Write an expression for the number of toothpicks required to make a pattern n triangles long.

MATHS MATE

Term 4 - Sheet 4

Name: .....

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

Parent's Signature: .....

1. [Long ×,÷] *

$25.5 \times 18 =$

2. [Decimal +,–] *

$12.5 - x = 2.451$

$x =$

3. [Decimal ×,÷]

$\sqrt{x} = 0.4$

$x =$

4. [Fraction +,–] *

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

5. [Fraction ×,÷] *

$\frac{f+1}{3} \times \frac{2}{f+1} =$

6. [Percentages] *

Lisa invests $1000 at 10% per annum compound interest. What will Lisa's investment be worth after 4 years?

$

7. [Integer +,–] *

$-p + (9p - 20p) =$

8. [Integer ×,÷] *

$\frac{8-6}{6-8} =$

9. [Rates / Ratios] *

How much petrol is required to drive from Brisbane to Gympie, a distance of 170 km, if your car's fuel consumption is 9 L/100 km?

L

10. [Indices] *

Simplify $\frac{5mn^{-2} \times 6m^2 \times 2}{4m^{-3} \times 15m^6 n^{-2}}$

11. [Square Roots / Surds] *

Expand and simplify

$(\sqrt{2} - 2\sqrt{5})(\sqrt{2} + 2\sqrt{5})$

12. [Order of Operations] *

$(5-5)^9 \div 2012 =$

13. [Exploring Number]

$\frac{19}{18} > \frac{20}{19}$ True or false?

14. [Scientific Notation] *

Evaluate and express in scientific notation

$(2 \times 10^{-3})^3$

15. [Number Patterns]

Find the rule of the sequence t_n where $n \geq 1$

13, 10, 7, 4, 1, ...

$t_n =$

16. [Expressions]

Find the difference between the polynomials:

$(3x^3 - 2x^2 + x - 2) - (2x^3 - x^2 + 2x - 5)$

17. [Substitution] *

If $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$, find the solutions x_1 and x_2, when $a = 4$, $b = 5$ and $c = 1$

18. [Expansion] *

Expand and simplify $(x + 2y - z)^2$

19. [Factorisation] *

Factorise

$3y^3 - 12y^2 + 12y$

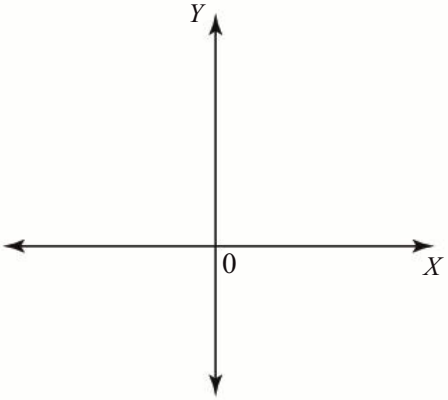
20. [Equations] *

Solve the inequality:

$x^2 + 4x + 4 \leq 0$

21. [Graphs & Functions] *

Sketch the graph of equation $y = 2x^2 + 1$ labelling the intercepts, axis of symmetry and turning point.



QUOTE OF THE WEEK: The noblest motive is the public good. Sir Richard Steele

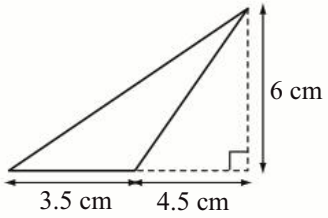
22. [Units of Measurement / Time]

How many litres in v cubic metres?

23. [Perimeter] *

Find the perimeter of the triangle.

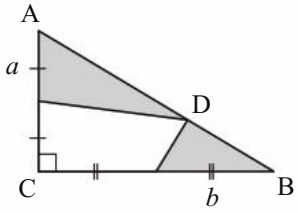
[Hint: Pythagoras' theorem will help.]



cm

24. [Area] *

Write a simple formula for the area A of the shaded region. [Note: D is a point anywhere along the side AB.]

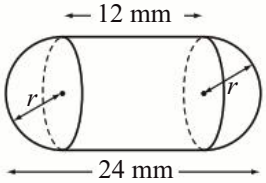


$A =$

25. [Volume] *

Find the volume of the penicillin capsule.

[Express your answer as a multiple of π.]



mm^3

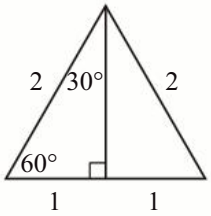
26. [Surface Area] *

A cone with a height equal to its diameter, a cube and a sphere all have exactly the same surface area. Which of the three solids will have the greatest volume?

27. [Pythagoras / Trigonometry] *

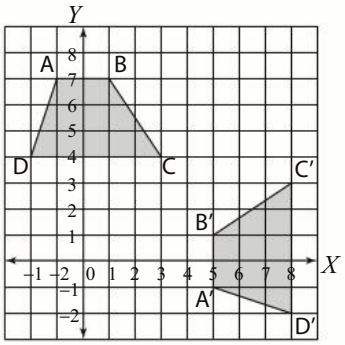
Use the triangle to find the value of tan 30°.

[Leave your answer in surd form.]



28. [Shape / Location]

What are the coordinates of the centre of rotation used to rotate the quadrilateral ABCD to its new position A'B'C'D'?



29. [Angles] *

Through how many degrees does the big hand of a clock move in 10 minutes?

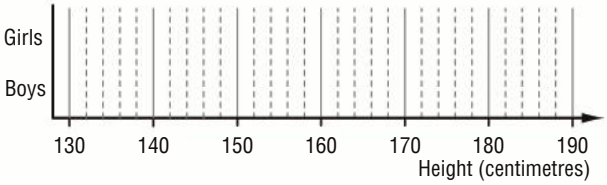
30. [Statistics]

Draw two comparative boxplots to illustrate the heights in centimetres of the boys and girls in a high school class.

Height Comparison

Girls:	138	145	148	150	154	155	155
	157	161	164	164	165	170	174

Boys:	140	143	146	150	154	159	164	166
	168	168	170	172	172	180	181	184



31. [Probability] *

There are 90 different two-digit numbers. How many of these do not contain any of the digits 1, 2, 3 or 4?

32. [Problem Solving 1] *

If it takes 8 builders 6 days to build a barn, how long would it take 12 builders to do the same job?

33. [Problem Solving 2] *

Two cyclists ride towards each other at 20 km/h from opposite ends of a straight stretch of road 40 km long. At the same time, a blowfly flies away from one cyclist towards the other at 30 km/h. When it meets the other cyclist, it is so scared that it turns around and heads back. It continues moving from one cyclist to the other until the cyclists meet. At this point the fly drops dead with fright. What was the total distance travelled by the blowfly?

km

MATHS MATE

Term 4 - Sheet 5

Name: .....

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

Parent's Signature: .....

1. [Long ×,÷] *

$1872 \div 48 =$

2. [Decimal +,–] *

$6.21 + x = 9.5$

$x =$

3. [Decimal ×,÷]

$x^3 = 0.008$

$x =$

4. [Fraction +,–] *

$\frac{1}{x} + \frac{1}{2x} =$

5. [Fraction ×,÷] *

$\frac{6n+3}{2n+1} =$

6. [Percentages] *

After 1 year, a boat has lost 15% of its value and it is now worth only $17 000. What did the boat cost when new?

$

7. [Integer +,–] *

$(2x - 5x) - (3x - 4x) =$

8. [Integer ×,÷] *

$\frac{-2}{3} \times \frac{24}{-4} =$

9. [Rates / Ratios] *

Jenny has $30, Lou has 50% more than Jenny, and Alex has twice as much as Lou. Express the amount of money owned by Jenny, Lou and Alex as a ratio in simplest form.

10. [Indices] *

Evaluate $(-1)^{2n+2} + (-1)^{2n+1} + (-1)^{2n}$, given n is a whole number.

11. [Square Roots / Surds] *

Rationalise $\frac{2}{\sqrt{3}+2}$

12. [Order of Operations] *

$(36 - 6^2) \div 2011 + 2012 =$

13. [Exploring Number] *

If A is 40% of B, express B as a percentage of A.

14. [Scientific Notation] *

Evaluate and express in scientific notation

$\sqrt{2.5 \times 10^7}$

15. [Number Patterns] *

If $t_1 = 625$ and $t_{n+1} = \frac{t_n}{5}$, find the first four terms of the pattern.

16. [Expressions]

An antique was bought for d dollars and then resold at 10% profit. In terms of d, what was the selling price?

$

17. [Substitution] *

If $t = x + 1$ and $y = 2t + 3$, express y in terms of x.

$y =$

18. [Expansion] *

Expand and simplify $(x + 1)(x + 1)(x + 1)$

19. [Factorisation]

Factorise

$6a^2 + 13a - 5$

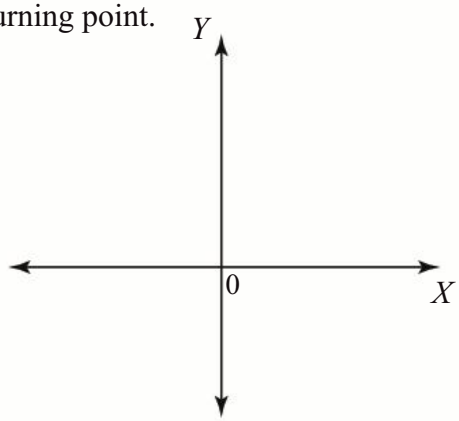
20. [Equations] *

Solve for x:

$4x^2 + 5x + 1 = 0$

21. [Graphs & Functions] *

Sketch the graph of equation $y = x^2 - 2x - 8$ labelling intercepts, axis of symmetry and turning point.



QUOTE OF THE WEEK: Why not go out on a limb? That's where all the fruit is. Will Rogers

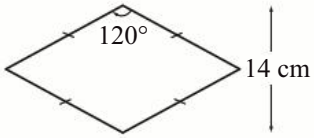
22. [Units of Measurement / Time]

What does the prefix 'kilo' represent?

A) 10^{-6} B) 10^{-3} C) 10^{3} D) 10^{6}

23. [Perimeter] *

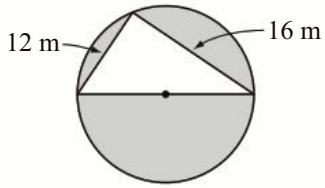
Find the perimeter of the rhombus.



cm

24. [Area] *

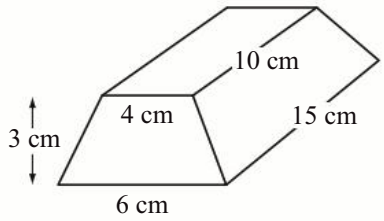
Using $\pi \approx 3.14$ find the shaded area.



m^2

25. [Volume] *

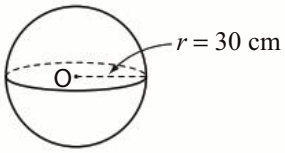
What is the volume of a gold ingot in the shape of a truncated pyramid? [Hint: Consider the ingot as the solid left after a rectangular pyramid is cut from the top of a larger rectangular pyramid.]



cm^3

26. [Surface Area] *

A record for the largest gum bubble ever blown was set in 1994. The almost spherical bubble had a radius of 30 cm. Use $\pi \approx 3.14$ to find the surface area of the bubble.

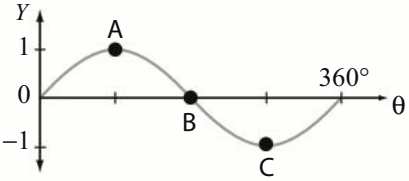


cm^2

27. [Pythagoras / Trigonometry]

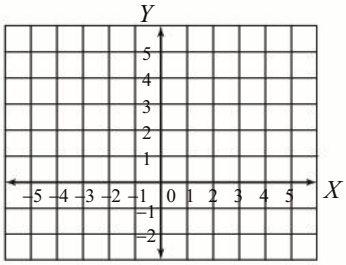
Complete the missing coordinates using the graph of $y = \sin\theta$

A(90°, ___) B(180°, ___) C(___, −1)



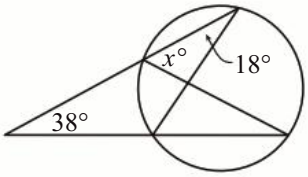
28. [Shape / Location]

Draw the shape formed by all the points that are equally distanced from the points (0,3) and (0,−1).



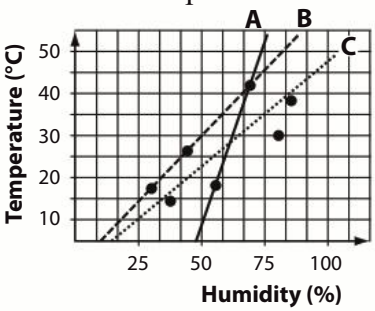
29. [Angles] *

Find the value of $x°$.



30. [Statistics]

Select the most appropriate 'line of best fit' for the scatter plot.



31. [Probability] *

You select a letter at random from the word MUMMY, and then choose another letter without replacing the first one. If the first letter was a 'U', what is the probability that the second letter will be an 'M'?

32. [Problem Solving 1]

Using the points below as the end points of lines, how many segments can be drawn if each segment is to have a different length?

33. [Problem Solving 2] *

Alex and young Brad can pick a bin full of apples in 90 minutes. Brad and Celia take 60 minutes to do the same job, but when Alex and Celia work together, it takes only 45 minutes to fill a bin. How long would each person take to pick a bin full of apples by themselves?

A = min, B = min, C = min

MATHS MATE

Term 4 - Sheet 6

Name: .....

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

Parent's Signature: .....

1. [Long ×,÷] *

$64.6 \div 19 =$

2. [Decimal +,–] *

$1.4 + x = 3.01$

$x =$

3. [Decimal ×,÷]

$x^2 = 0.25$

$x =$

4. [Fraction +,–] *

$\frac{1}{3y} + \frac{1}{y} =$

5. [Fraction ×,÷] *

$\frac{k^2 - k}{k - 1} =$

6. [Percentages] *

A new computer is bought for $2200. The value depreciates 20% in the first year. What is the calculated value of the computer after 1 year?

$

7. [Integer +,–] *

$(4y - y) + (2y - 7y) =$

8. [Integer ×,÷] *

$\frac{5 - 15}{2 - 7} =$

9. [Rates / Ratios] *

Tom, George and Mary share a pizza. Tom eats half of it and George eats two thirds of the rest. Write the amount eaten by Tom, George and Mary as a ratio in simplest form.

10. [Indices] *

$2^{333} < 3^{222}$ True or false?

11. [Square Roots / Surds] *

Rationalise $\frac{\sqrt{2} + \sqrt{5}}{\sqrt{2} - \sqrt{5}}$

12. [Order of Operations] *

$(7 \times 8 - 55)^9 - 2^3 =$

13. [Exploring Number] *

If C is 80% of D, express D as a percentage of C.

14. [Scientific Notation] *

Evaluate and express in scientific notation

$\sqrt{4.9 \times 10^{-3}}$

15. [Number Patterns] *

If $t_1 = 3$ and $t_{n+1} = \frac{1}{t_n}$, find the first four terms of the pattern.

16. [Expressions]

Robert bought b books. How many pens could he have bought with the same amount of money if two books cost as much as five pens?

pens

17. [Substitution] *

If $t = 2x + 1$ and $y = 2t$, express y in terms of x.

$y =$

18. [Expansion] *

Expand and simplify

$(a + 3)(a - 3)(a + 2)$

19. [Factorisation] *

Factorise $x^4 - 16y^4$

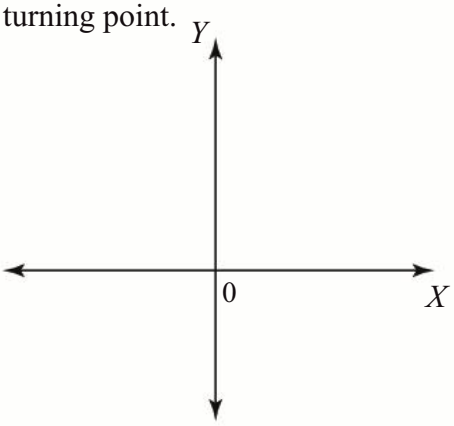
20. [Equations] *

Solve for x:

$4x^2 - 8x + 3 = 0$

21. [Graphs & Functions] *

Sketch the graph of equation $y = x^2 + 2x + 1$ labelling intercepts, axis of symmetry and turning point.



QUOTE OF THE WEEK: If you're going through hell, keep going. Winston Churchill

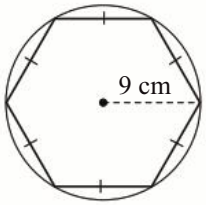
22. [Units of Measurement / Time]

What does the prefix 'giga' represent?

A) 10^3 B) 10^6 C) 10^9 D) 10^{12}

23. [Perimeter] *

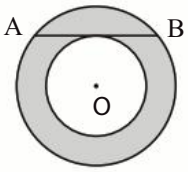
Find the perimeter of the regular hexagon that just fits inside a circle of radius 9 cm.



cm

24. [Area] *

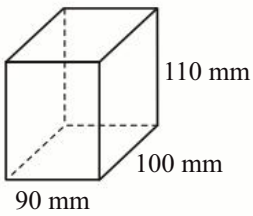
AB is tangent to the smaller circle and its length is 20 cm. Using $\pi \approx 3.14$ find the area of the shaded region. [Hint: Pythagoras' theorem will help!]



cm^2

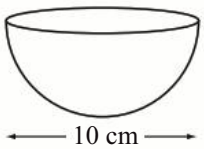
25. [Volume] *

A woodturner wishes to create a cylinder from a rectangular block of wood. Using $\pi \approx 3.14$ what is the greatest volume, in cm^3, the cylinder can have?



26. [Surface Area] *

Using $\pi \approx 3.14$ find the total surface area of the solid hemisphere.

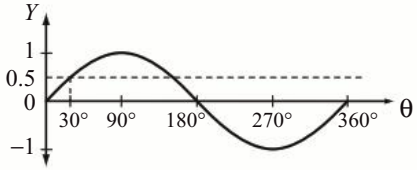


cm^2

27. [Pythagoras / Trigonometry]

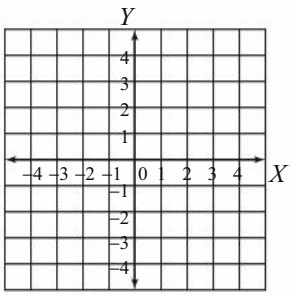
The graph shows that $\sin 30° = 0.5$

What is the other angle between 0° and 360° that has the same sine value?



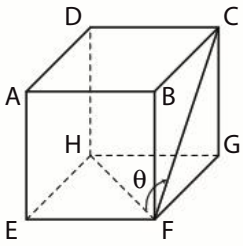
28. [Shape / Location]

Draw the shape formed by all the points that are at a distance of 3 units from the point (–2,1).



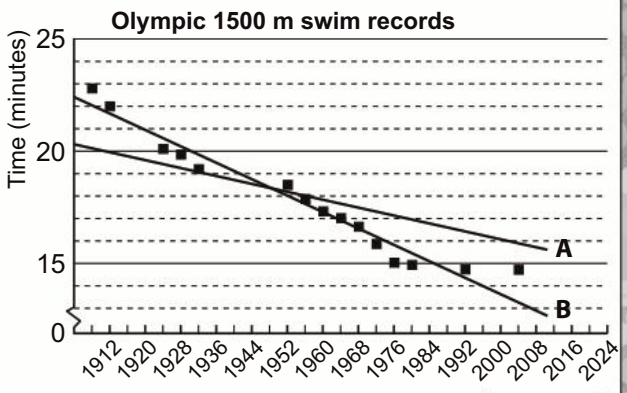
29. [Angles] *

Find the value of ∠HFC, marked θ, in the cube.



30. [Statistics]

Select the most appropriate 'line of best fit' for the scatter plot.

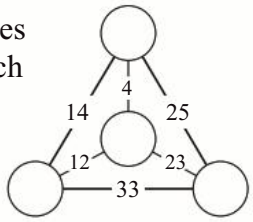


31. [Probability] *

There are 5 novels, 3 dictionaries and 2 video tapes on a shelf. An item is picked at random and not replaced. What is the probability that a second item selected will be a novel, given that the first was a video?

32. [Problem Solving 1]

Enter numbers in the circles so that the numbers on each line equal the sum of the numbers at each end.



33. [Problem Solving 2] *

$100! = 100 \times 99 \times 98 \times 97 \ldots\ldots \times 2 \times 1$

If you were to evaluate 100 factorial by multiplying all these terms together, how many zeros would there be on the end of your answer?

MATHS MATE

Term 4 - Sheet 7

Name: .....

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

Parent's Signature: .....

1. [Long ×,÷] *

$36.8 \div 23 =$

2. [Decimal +,–] *

$2.5 + x = 2.51$

$x =$

3. [Decimal ×,÷]

$x^2 = 0.0144$

$x =$

4. [Fraction +,–] *

$\frac{1}{x} + \frac{1}{y} =$

5. [Fraction ×,÷] *

$\frac{k^2 - 1}{k - 1} =$

6. [Percentages] *

After 1 year, a computer has lost 30% of its value and is now worth only $4900. What did it cost when new?

$

7. [Integer +,–] *

$(6s - 7s) - (8s - 9s) =$

8. [Integer ×,÷] *

$\frac{-3}{-4} \times \frac{72}{2} =$

9. [Rates / Ratios] *

This table is printed on the side of a box of muffin mix. What is the ratio in simplest form of mix to water, in each case?

muffins	amount of mix	amount of water
12	1 cup	$\frac{3}{4}$ cups
24	2 cups	$1\frac{1}{2}$ cups
36	3 cups	$2\frac{1}{4}$ cups

10. [Indices] *

Evaluate $5 \times (-1)^{2n} - 3 \times (-1)^{2n+1}$, given n is a whole number.

11. [Square Roots / Surds] *

Rationalise $\frac{2\sqrt{3}}{\sqrt{3}+1}$

12. [Order of Operations] *

$(6 - 8) \times 3^2 + 25 =$

13. [Exploring Number] *

If A is $166\frac{2}{3}$% of B, express B as a percentage of A.

14. [Scientific Notation]

Evaluate and express in scientific notation $\sqrt{4 \times 10^{-8}}$

15. [Number Patterns] *

If $t_1 = 3$, $t_2 = 4$ and $t_{n+1} = t_n + t_{n-1}$, find the first four terms of the pattern.

16. [Expressions]

If the cost of p mangoes is d cents, what is the cost of z mangoes?

$

17. [Substitution] *

If $t = 3x$ and $y = t^2 - 1$, express y in terms of x.

$y =$

18. [Expansion] *

Expand and simplify $(x + 3)(x + 2)(x + 5)$

19. [Factorisation]

Factorise $x^4 + 2x^2y + y^2$

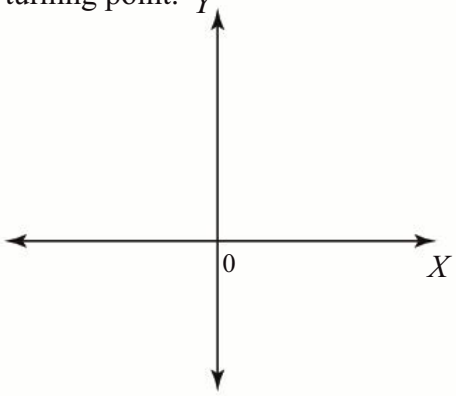
20. [Equations] *

Solve for x:

$2x^2 + 3x + 1 = 0$

21. [Graphs & Functions] *

Sketch the graph of equation $y = x^2 - 4x + 3$ labelling intercepts, axis of symmetry and turning point.



QUOTE OF THE WEEK: 'Tis known by the name of perseverance in a good cause, and of obstinacy in a bad one. Laurence Sterne

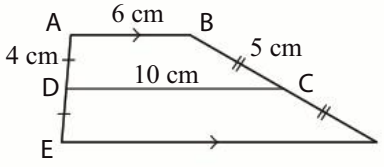
22. [Units of Measurement / Time]

What does the prefix 'micro' represent?

A) 10^{-9} B) 10^{-6} C) 10^{-3} D) 10^{-1}

23. [Perimeter] *

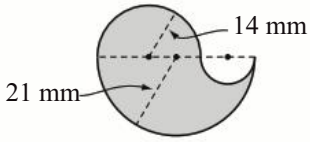
Find the perimeter of the trapezium ABFE.



cm

24. [Area] *

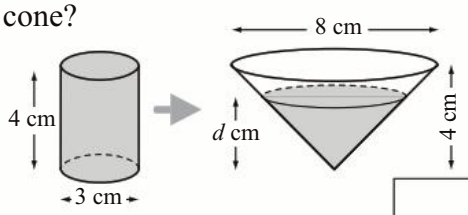
Using $\pi \approx \frac{22}{7}$ find the area of the shape.



mm^2

25. [Volume] *

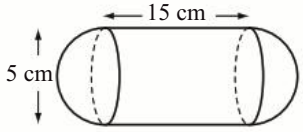
A cylinder full of water has been poured into a cone. What is the depth 'd' of the water in the cone?



cm

26. [Surface Area] *

A gas tank has the shape of a cylinder with a hemisphere each end as shown. Using $\pi \approx 3.14$ find the tank's total surface area.

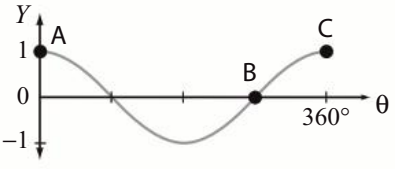


cm^2

27. [Pythagoras / Trigonometry]

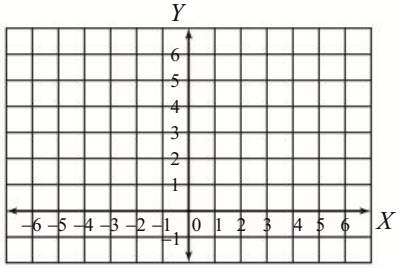
Complete the missing coordinates using the graph of $y = \cos\theta$.

A(0°, ____) B(____ , 0) C(____ , 1)



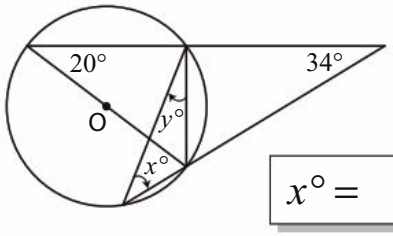
28. [Shape / Location]

Draw the shape formed by all the points that are in the first quadrant, equally distanced from the lines $x = -2$ and $x = 4$.



29. [Angles] *

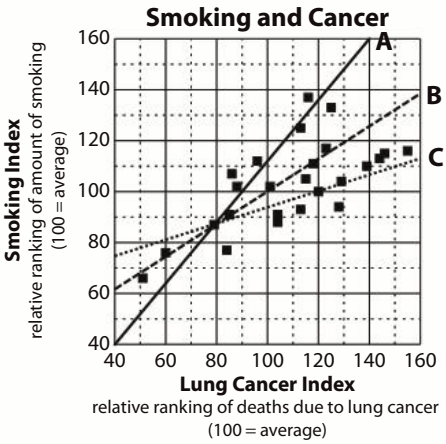
Find the values of $x°$ and $y°$.



$x° =$ $y° =$

30. [Statistics]

Select the most appropriate 'line of best fit' for the scatter plot.



31. [Probability] *

A bag contains 4 red and 2 green marbles. Two marbles are randomly selected. Given that the first is red, find the probability that the second is also red.

32. [Problem Solving 1] *

A snail was trying to climb out of a well that was 8 metres deep. Each day he climbed 3 metres, and each night he slipped back 2 metres. This pattern of climbing 3 metres by day and falling 2 metre by night, was continued. How many days did the snail take to reach the top of the well?

days

33. [Problem Solving 2] *

"How old are your three children?" the mathematics teacher asks a former student. He is told their ages add to 13 and multiply to give the number on his classroom door (which they both can see). "I will need to know more," the teacher says, after a few moments reflection. He is told that the eldest child is learning to play the violin. After this the teacher knew the 3 ages.

What are their ages?

MATHS MATE

Term 4 - Sheet 8

Name: .....

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

Parent's Signature: .....

1. [Long ×,÷] *

$910 \div 26 =$

2. [Decimal +,−] *

$0.053 + x = 1$

$x =$

3. [Decimal ×,÷]

$\sqrt{x} = 0.3$

$x =$

4. [Fraction +,−] *

$\frac{1}{x} + \frac{1}{(x+1)} =$

5. [Fraction ×,÷] *

$\frac{4y+12}{4y} =$

6. [Percentages] *

A new car is bought for \$23 900. The value depreciates 20% per year. Find the value of the car at the end of the second year.

\$

7. [Integer +,−] *

$(w - 2w) + (3w - 4w) =$

8. [Integer ×,÷] *

$\frac{-50}{3} \times \frac{-18}{2} =$

9. [Rates / Ratios] *

This table is printed on the side of a box of muffin mix. How many cups of mix should be used to make 50 muffins? [Leave your answer as a mixed number.]

muffins	amount of mix	amount of water
12	1 cup	$\frac{3}{4}$ cups
24	2 cups	$1\frac{1}{2}$ cups
36	3 cups	$2\frac{1}{4}$ cups

10. [Indices] *

Given $2^{23} = 8\,388\,608$ evaluate 8^8.

11. [Square Roots / Surds] *

Rationalise $\frac{2\sqrt{3}-1}{\sqrt{3}-1}$

12. [Order of Operations] *

$(10\,001 - 10^4) \times 1999 =$

13. [Exploring Number] *

If A is $133\frac{1}{3}\%$ of B, express B as a percentage of A.

14. [Scientific Notation]

Evaluate and express in scientific notation

$\sqrt{1.21 \times 10^{-4}}$

15. [Number Patterns] *

If $t_1 = 3$, $t_2 = 1$ and $t_{n+1} = t_{n-1} - t_n$, find the first four terms of the pattern.

16. [Expressions]

To produce a single bottle of grape juice g kilograms of grapes are required. How many kilograms of grapes are needed to make b bottles of grape juice?

kg

17. [Substitution] *

If $x = t - 1$ and $y = t - 2$, express y in terms of x.

$y =$

18. [Expansion] *

Expand and simplify

$(x + 1)^2(x - 1)$

19. [Factorisation] *

Factorise

$3y^3 - 12y^2 + 12y$

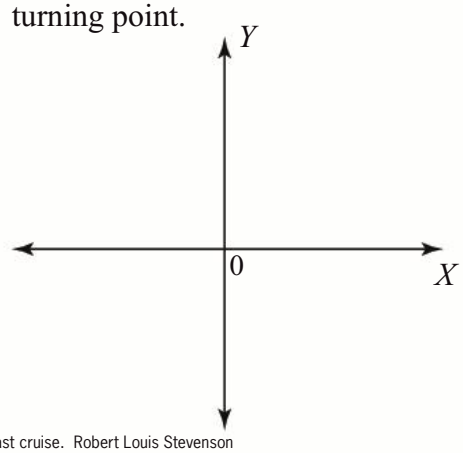
20. [Equations] *

Solve for x:

$x^2 - 6x - 7 = 0$

21. [Graphs & Functions] *

Sketch the graph of equation $y = x^2 + 2x - 3$ labelling intercepts, axis of symmetry and turning point.



QUOTE OF THE WEEK: Old and young, we are all on our last cruise. Robert Louis Stevenson

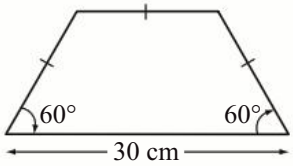
22. [Units of Measurement / Time]

What does the prefix 'mega' represent?

A) 10^9 B) 10^6 C) 10^3 D) 10^1

23. [Perimeter] *

Find the perimeter of the trapezium.



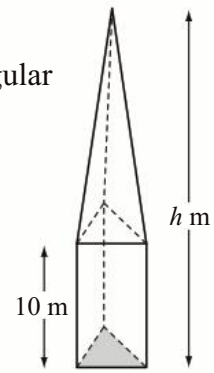
cm

24. [Area] *

If you double the circumference of a circle what will happen to its area?

25. [Volume] *

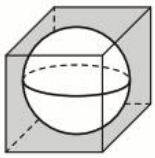
An obelisk type monument is constructed by placing a triangular pyramid on top of a triangular prism as shown. The same volume of concrete was used to form both the 10 m high prism which forms the base and the pyramid on top. What is the full height '*h*' of the monument?



m

26. [Surface Area] *

Using $\pi \approx 3.14$ find the surface area of a sphere which just fits inside a cube with a volume of 1000 cm^3.

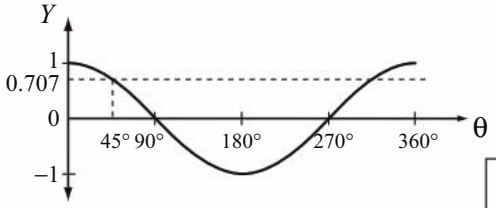


cm^2

27. [Pythagoras / Trigonometry]

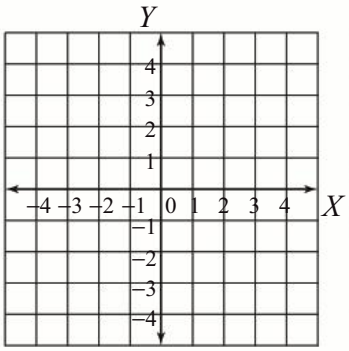
The graph shows that $\cos 45° \approx 0.707$

What is the other angle between 0° and 360° that has the same cosine value?



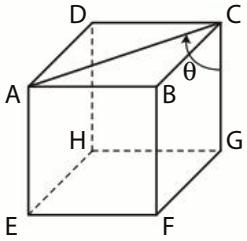
28. [Shape / Location]

Draw the shape formed by all the points that are in the fourth quadrant, equally distanced from the *X* and *Y* axes.



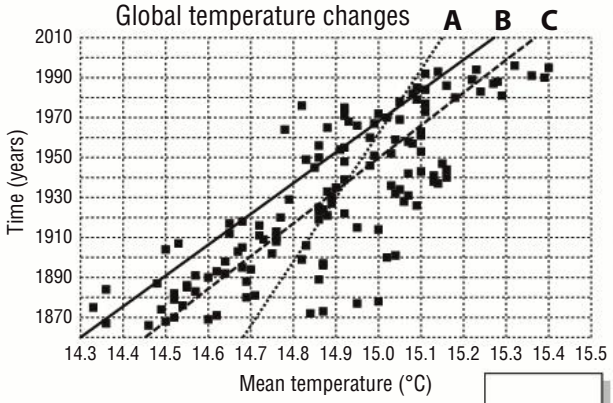
29. [Angles] *

Find the value of ∠ACG, marked θ, in the cube.



30. [Statistics]

Select the most appropriate 'line of best fit'.



31. [Probability] *

A red die is rolled, and then a blue die is rolled. What is the probability of obtaining a total of 7 given that a 4 was thrown with the red die?

32. [Problem Solving 1] *

I reduced a diagram on my computer using a scale factor of 80%. What scale factor is required to return the diagram to its original size?

33. [Problem Solving 2] *

An orange can be cut into eight pieces using just three straight cuts. Find the maximum number of pieces obtainable using seven cuts.

3 cuts gives 8 pieces.