Australian Curriculum Edition

MATHS PLUS

Student Book

6

Harry O'Brien • Greg Purcell

OXFORD

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Contents

Contents

To the teacher

The *Maths Plus* Australian Curriculum series, Foundation to Year 6, is based on the **Australian Curriculum Mathematics** (ACARA). Each book beyond the one for Foundation, builds upon prior knowledge and works towards understanding of the achievement standards for the relevant year level and beyond.

This series provides students with opportunities to sequentially develop their skills and knowledge in the three strands of the **Australian Curriculum Mathematics**:

Number and Algebra   **Measurement and Geometry**   **Statistics and Probability**
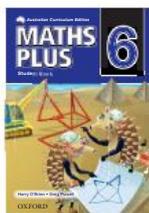
Series components

Interactive whiteboard lessons
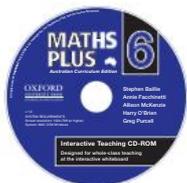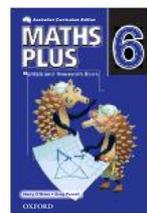
Unique mathematical representations of concepts prior to consolidating understanding through the use of the Student Book.

Student Books

Work towards achieving the relevant Australian Curriculum achievement standards by developing skills and competency in **understanding**, **fluency**, **reasoning** and **problem solving.**

Mentals and Homework Books

Concise and essential revision and consolidation activities that correspond one-on-one with the concepts and units of work presented in the Student Books.

Teaching Guide: provides full support for teachers.

Series features

- All student activity pages are colour coded to match the three **Australian Curriculum Mathematics** strands (Note: AusVELS compliant).

- **Australian Curriculum Mathematics** content descriptions, proficiency strand references and cross curriculum areas appear as footers on each student activity page.

- The four diagnostic term reviews assist in pin-pointing the specific strengths and weaknesses of each student, allowing specific intervention and re-teaching opportunities where required.

- The 16 Investigations allow students to apply their knowledge through relevant, investigative activities.

Number and Algebra

Measurement and Geometry

Statistics and Probability
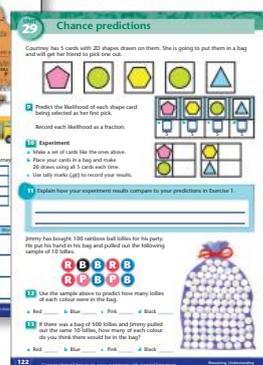
Diagnostic review for each term
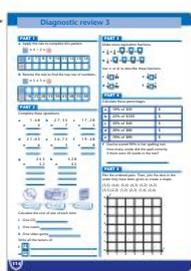
Investigations covering all 3 strands
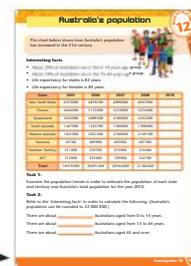
Teachers can be confident that all **Australian Curriculum Mathematics** content descriptors have been addressed. The **Find a Topic** pages allow teachers the freedom to address particular topics and student needs as appropriate, providing essential revision and consolidation opportunities.

Find a topic

Australian Curriculum

Units	1	2	3	4
Number and Algebra				
Number and place value				
Identify and describe properties of prime, composite, square and triangular numbers	▨		▨	
Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers	▨	▨		▨
Investigate everyday situations that use integers. Locate and represent these numbers on a number line				
Fractions and decimals				
Compare fractions with related denominators and locate and represent them on a number line				
Solve problems involving addition and subtraction of fractions with the same or related denominators				
Find a simple fraction of a quantity where the result is a whole number, with and without digital technologies				
Add and subtract decimals, with and without digital technologies, and use estimation and rounding to check the reasonableness of answers		▨		
Multiply decimals by whole numbers and perform divisions by non-zero whole numbers where the results are terminating decimals, with and without digital technologies				
Multiply and divide decimals by powers of 10				
Make connections between equivalent fractions, decimals and percentages			▨	
Money and financial mathematics				
Investigate and calculate percentage discounts of 10%, 25% and 50% on sale items, with and without digital technologies				
Patterns and algebra				
Continue and create sequences involving whole numbers, fractions and decimals. Describe the rule used to create the sequence			▨	▨
Explore the use of brackets and order of operations to write number sentences				
Measurement and Geometry				
Using units of measurement				
Connect decimal representations to the metric system				
Convert between common metric units of length, mass and capacity				
Solve problems involving the comparison of lengths and areas using appropriate units		▨		
Connect volume and capacity and their units of measurement				
Interpret and use timetables				
Shape				
Construct simple prisms and pyramids			▨	
Location and transformation				
Investigate combinations of translations, reflections and rotations, with and without the use of digital technologies				
Introduce the Cartesian coordinate system using all four quadrants				
Geometric reasoning				
Investigate, with and without digital technologies, angles on a straight line, angles at a point and vertically opposite angles. Use results to find unknown angles	▨	▨		▨
Statistics and Probability				
Chance				
Describe probabilities using fractions, decimals and percentages				
Conduct chance experiments with both small and large numbers of trials using appropriate digital technologies				
Compare observed frequencies across experiments with expected frequencies				
Data representation and interpretation				
Interpret and compare a range of data displays, including side-by-side column graphs for two categorical variables				
Interpret secondary data presented in digital media and elsewhere	▨			

Place value

1 Write the numbers represented on each abacus. Don't forget '0' is the place holder.

a ☐

b ☐

c ☐

d ☐

HThou TenThou Thou Hund Tens Ones (×4)

2 Draw beads on the abacuses to represent the numbers.

a | 727 256 |

b | 357 492 |

c | 806 207 |

d | 810 027 |

HThou TenThou Thou Hund Tens Ones (×4)

Reading numbers

When we read numbers, we read them in groups of hundreds, tens and ones.
The following chart best illustrates this concept.

Examples

	Millions			Thousands			Ones		
	Hund	Tens	Ones	Hund	Tens	Ones	Hund	Tens	Ones
206 341				2	0	6	3	4	1
257 403 280	2	5	7	4	0	3	2	8	0

Note: A space separates the millions, thousands and ones when the number is larger than 9999.

	H T O		H T O	
Example 1 reads	2 0 6	thousand	3 4 1	ones

	H T O		H T O		H T O	
Example 2 reads	2 5 7	million	4 0 3	thousand	2 8 0	ones

3 Write the numbers on the place value grid before adding the correct spaces to the number.

	Jumbled	Millions			Thousands			Ones			Spaced numbers
		Hund	Tens	Ones	Hund	Tens	Ones	Hund	Tens	Ones	
a	11234					1	1	2	3	4	11 234
b	32451										
c	736041										
d	5425006										
e	7325400										
f	76245236										

Identify and describe properties of prime, composite, square and triangular numbers

Understanding, Problem solving
CCT N

Addition and subtraction strategies

4 Add these numbers mentally.

a 64 + 29 =	**f** 156 + 19 =	**k** 128 + 67 =
b 135 + 38 =	**g** 127 + 37 =	**l** 347 + 47 =
c 163 + 29 =	**h** 229 + 48 =	**m** 675 + 29 =
d 135 + 28 =	**i** 333 + 29 =	**n** 876 + 37 =
e 237 + 49 =	**j** 247 + 38 =	**o** 293 + 58 =

67 + 28?
Think 67 + 30 minus 2,
97 – 2 = 95.

5 Give an estimate for each question by rounding each number. The first one has been done for you.

a 212 + 397 ≈ 600	**g** 354 + 146 ≈ _____	**m** 1379 + 222 ≈ _____
b 316 + 484 ≈ _____	**h** 245 + 360 ≈ _____	**n** 1498 + 307 ≈ _____
c 309 + 201 ≈ _____	**i** 739 + 555 ≈ _____	**o** 1689 + 221 ≈ _____
d 678 + 320 ≈ _____	**j** 347 + 563 ≈ _____	**p** 2365 + 437 ≈ _____
e 476 + 281 ≈ _____	**k** 797 + 707 ≈ _____	**q** 5290 + 615 ≈ _____
f 979 + 219 ≈ _____	**l** 369 + 432 ≈ _____	**r** 309 + 2388 ≈ _____

6 Subtract these numbers mentally.

a 75 − 39 =	**f** 193 − 49 =	**k** 187 − 38 =
b 87 − 48 =	**g** 292 − 38 =	**l** 297 − 27 =
c 93 − 49 =	**h** 156 − 27 =	**m** 356 − 49 =
d 87 − 58 =	**i** 194 − 29 =	**n** 275 − 37 =
e 86 − 37 =	**j** 176 − 39 =	**o** 196 − 29 =

64 – 38?
Think 64 – 40
then add 2.
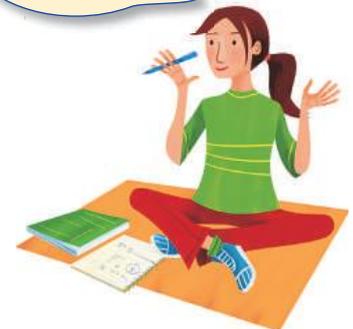
7 Estimate first, then solve the problems mentally.

	Problem	Estimate	Answer
a	Mr Burns had 155 sheep in one paddock and 38 sheep in another. How many sheep did he have altogether?		
b	Mrs Cook had 379 g of flour and 122 g of sugar. If she mixed them together, how much would they weigh?		
c	Jessica had a collection of 156 hair clips but sold 39 of them. How many hair clips does she have left?		
d	Josh travelled 1106 km on Tuesday and 488 km on Wednesday. How far has he travelled altogether?		
e	Uncle Sam's Car Sales had 173 vehicles in the lot. If 58 of them were damaged by hail, how many were not damaged?		

Problem solving
L N

Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers

3
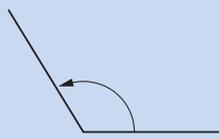
Angles are classified according to the amount of turn between two arms.
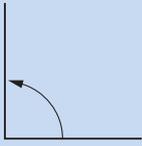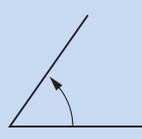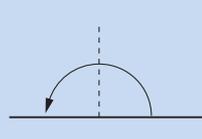
Right angle	Obtuse angle	Acute angle	Straight angle	Reflex angle
Square corner 90°	Greater than 90° but less than 180°	Less than 90°	Can be made from 2 right angles 180°	Greater than 180° but less than 360°
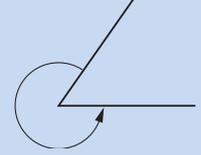
8 Measure and label the angles either right angle, obtuse, acute, reflex or straight.

a

___°___

d

___°___

g

___°___

b

___°___

e

___°___

h

___°___

c

___°___

f

___°___

i

___°___
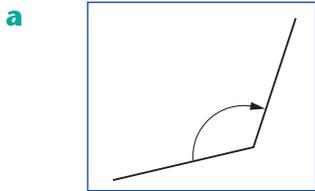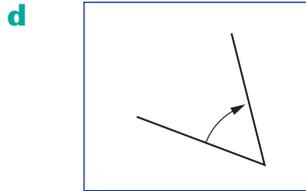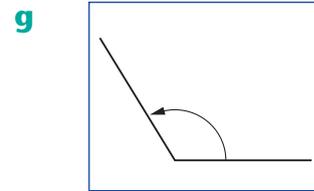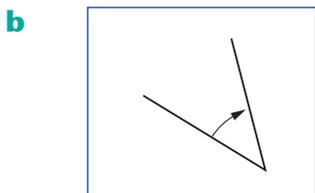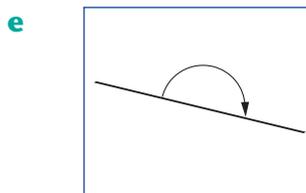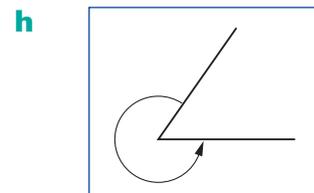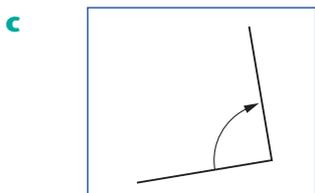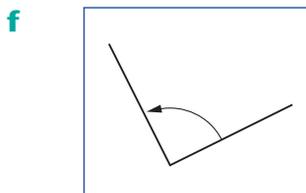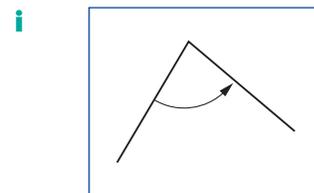
9 Draw these angles from the given base lines.

An acute angle of 40°	An obtuse angle of 110°	A right angle of 90°

Investigate, with and without digital technologies, angles on a straight line, and angles at a point and vertically opposite angles. Use results to find unknown angles

Problem solving
N L

Mr Cook did a survey to find out how children most commonly use the computer, then recorded the data in the form of a picture graph.

Computer use

| | Games | Study | Email | Internet | Word processing |

| KEY | = 10 children |
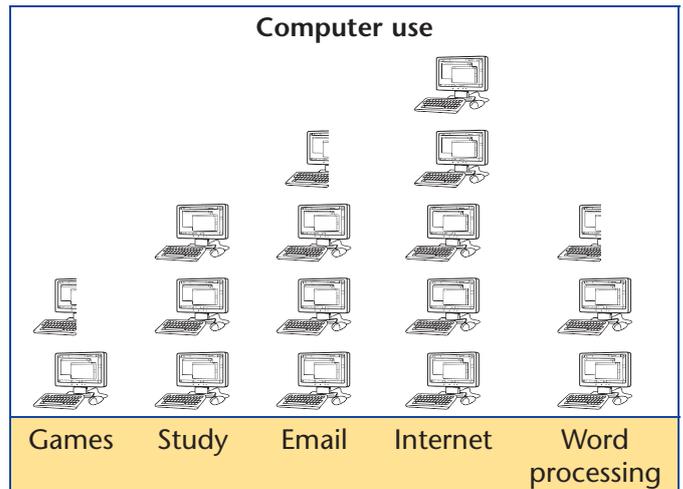
10 Use the key to answer the questions.

a How many children answered study? _____

b How many children answered Internet? _____

c How many children answered email? _____

d How many more answered Internet than study? _____

e Which was the least common answer? _____

Mrs Brown's class did a survey to find out the most common eye colour of senior students. They made a table of the data.

Eye colours

Colour	Tally
Blue	卌 卌 卌 卌 卌 卌 卌 I
Green	卌 III
Brown	卌 卌 卌 卌 卌 卌 II
Hazel	卌 卌 卌 卌 IIII

Blue	Green	Brown	Hazel

11 Create a picture graph using the given key.

 = 4 children

12 Answer the questions.

a Which eye colour was the most common? _____

b Which eye colour was the least common? _____

c How many more children had blue eyes than brown eyes? _____

13 Explain how you could make this survey more reflective of the whole population of people in Australia.

Multiplication strategies

1 Complete the multiplication grid.

×	4	6	5	0	7	10	9	3	8	1
3										
4										
5										
6										
7										
8										
9										

Learn any facts you don't know.

$4 \times 3 = 12$
so
$40 \times 3 = 120.$

2 Use your knowledge of number facts to answer these questions.

a $4 \times 5 =$

b $40 \times 5 =$

c $6 \times 7 =$

d $60 \times 7 =$

e $30 \times 8 =$

f $40 \times 3 =$

g $50 \times 7 =$

h $70 \times 5 =$

i $60 \times 3 =$

j $90 \times 2 =$

k $20 \times 9 =$

l $30 \times 9 =$

m $40 \times 7 =$

n $50 \times 8 =$

o $60 \times 6 =$

p $300 \times 4 =$

q $400 \times 5 =$

r $600 \times 6 =$

s $800 \times 8 =$

t $900 \times 7 =$

3 Multiply by 10 then halve to multiply by 5.

a $12 \times 5 =$

b $14 \times 5 =$

c $16 \times 5 =$

d $18 \times 5 =$

e $20 \times 5 =$

f $24 \times 5 =$

g $36 \times 5 =$

h $48 \times 5 =$

i $38 \times 5 =$

j $42 \times 5 =$

k $44 \times 5 =$

l $50 \times 5 =$

4 Use the double then double again strategy to multiply by 4 or the double, double, double strategy to multiply by 8.

$23 \times 4 = ?$
Think double $23 = 46.$
Double $46 = 92.$

a $12 \times 4 =$

b $15 \times 4 =$

c $16 \times 4 =$

d $22 \times 4 =$

e $18 \times 4 =$

f $33 \times 4 =$

g $45 \times 4 =$

h $8 \times 8 =$

i $12 \times 8 =$

j $16 \times 8 =$

k $13 \times 8 =$

l $14 \times 8 =$

m $23 \times 8 =$

n $32 \times 8 =$

o $17 \times 8 =$

5 Round to the nearest 10 or 100 to make an estimate of these multiplications.

a $19 \times 3 \approx$

b $22 \times 4 \approx$

c $28 \times 5 \approx$

d $31 \times 6 \approx$

e $18 \times 7 \approx$

f $23 \times 8 \approx$

g $57 \times 5 \approx$

h $39 \times 6 \approx$

i $42 \times 4 \approx$

j $199 \times 5 \approx$

k $302 \times 6 \approx$

l $204 \times 7 \approx$

Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers

Problem solving
N CCT

6 Steve has just begun work as a carpenter and his first job is to measure and cut some timber, which will later be nailed together.

Add these decimals, but before you do, **estimate** the total in **whole** metres, so that you have an idea of how much timber is to be used. Remember to keep the decimal points in a straight line.

a
```
  2 . 1 2 0 m
  3 . 0 1 2 m
+ 6 . 1 3 4 m
_____

Est: _____
```

b
```
  2 . 2 1 2 m
  3 . 2 1 3 m
+ 5 . 0 0 4 m
_____

Est: _____
```

c
```
  3 . 5 0 1 m
  4 . 0 0 6 m
+ 9 . 5 0 0 m
_____

Est: _____
```

d
```
  4 . 9 0 1 m
  3 . 0 0 1 m
+ 4 . 1 0 2 m
_____

Est: _____
```

e
```
  4 . 5 0 2 m
  3 . 5 1 2 m
+ 4 . 0 2 8 m
_____

Est: _____
```

f
```
  4 . 4 0 4 m
  2 . 2 0 2 m
+ 4 . 1 0 1 m
_____

Est: _____
```

Two things to remember!
Keep your saw in a straight line.
Keep your decimal points in a vertical line.

7 The post office has measured and recorded the distances between towns on this map of Tennis Island. Calculate the shortest distances beween the towns. The first one is done for you.

Graf — 44.521 km — Seles
16.545 km
21.399 km
Court
11.065 km
24.078 km
17.362 km
Williams
11.476 km
Evert
Navratilova
Goolagong

a	b	c	d

Graf and Goolagong
 	
  4 4 . 5 2 1 km
+ 1 7 . 3 6 2 km
  6 1 . 8 8 3 km
	Graf and Court	Navratilova and Seles	Goolagong and Court
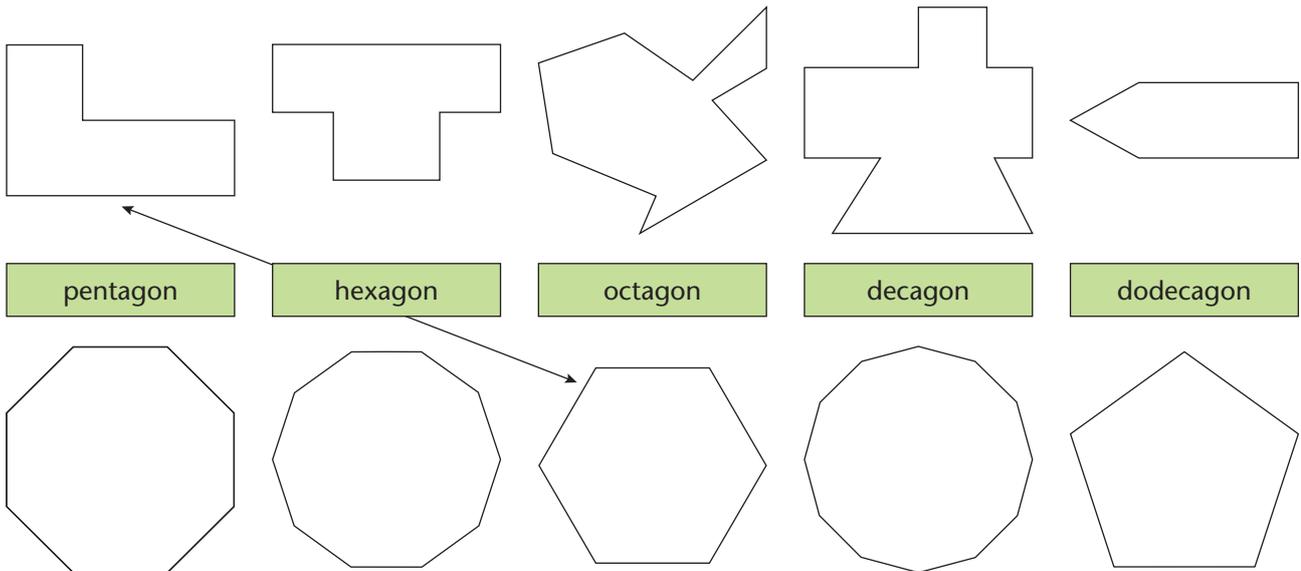
e	f	g	h
Evert and Seles	Evert and Williams	Navratilova and Graf	Court and Seles

Fluency, Problem solving, Understanding
N CCT

Add and subtract decimals, with and without digital technologies, and use estimation and rounding to check the reasonableness of answers

7

A **polygon** is any two-dimensional shape that has three or more straight sides and angles.

8 Name the four types of triangles. scalene, isosceles, right angle, equilateral

a _____

b _____

c _____

d _____
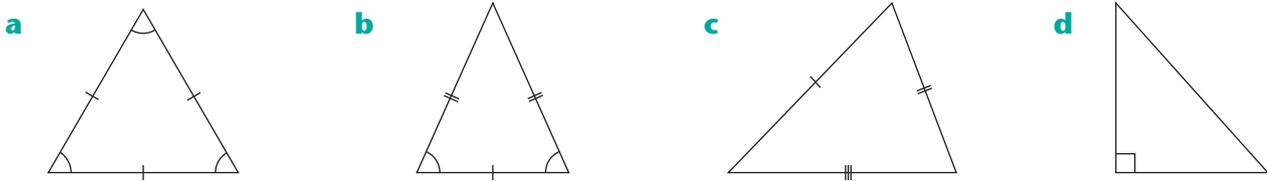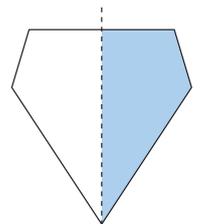
9 Draw lines to match the regular and irregular polygons to their names.

| pentagon | hexagon | octagon | decagon | dodecagon |

10 Record the properties of these regular polygons.

	Illustration	Name	Number of sides	Number of angles	Number of axes of symmetry
a					
b					
c					

An axis of symmetry divides a shape into halves.

Investigate, with and without digital technologies, angles on a straight line, angles at a point and vertically opposite angles. Use results to find unknown angles

Fluency, Problem solving
CCT L

The formula used to calculate the area of a rectangle is
Area = length × width.
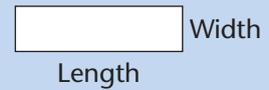
Width

Length

11 Use the formula **Area = length × width** to calculate the area of the shapes in square centimetres. Record your answers in the table.

4 cm

a

3 cm

4 cm

c

2 cm

3 cm

b

5 cm

7 cm

d

2 cm
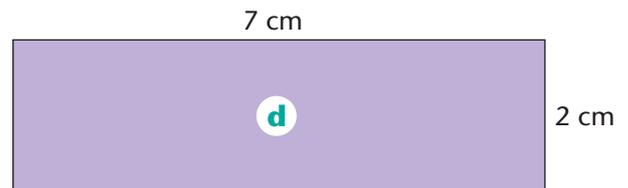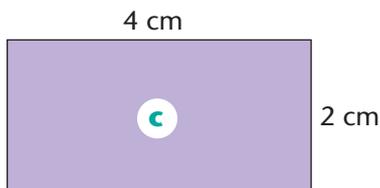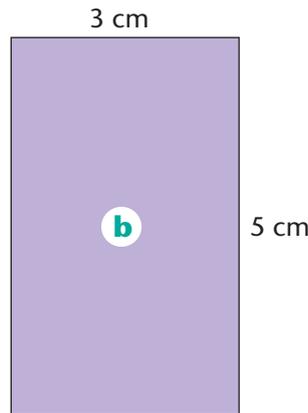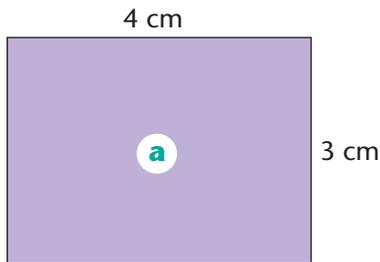
Shape	L × W	Area
a	×	cm²
b	×	cm²
c	×	cm²
d	×	cm²

12 Calculate the area of these shapes in square metres.

9.6 m

3 m

a
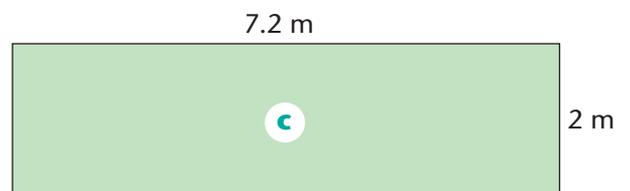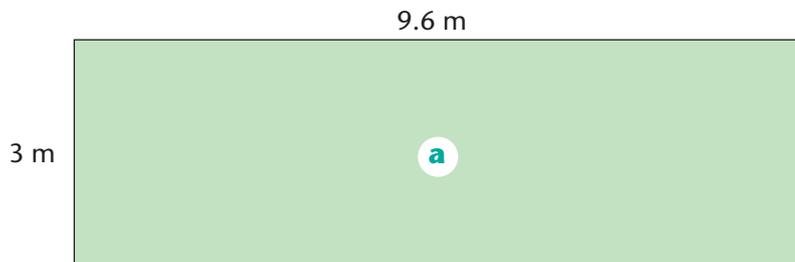
Shape	L × W	Area
a	×	m²
b	×	m²
c	×	m²

6.3 m

2 m

b

7.2 m

c

2 m

13 Break these shapes into rectangles in order to work out their area. The first one has been done for you.

a

2 cm

4 cm

3 cm

2 cm

3 cm

b

1 cm

2 cm

4 cm

2 cm

1 cm

c

2 cm

2 cm

4 cm

3 cm

2 cm

5 cm
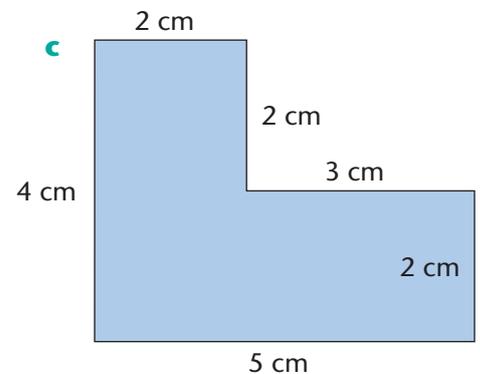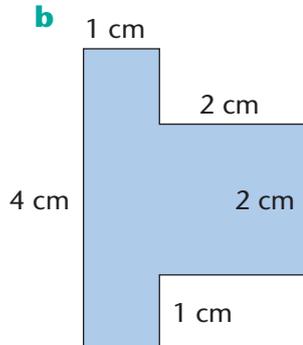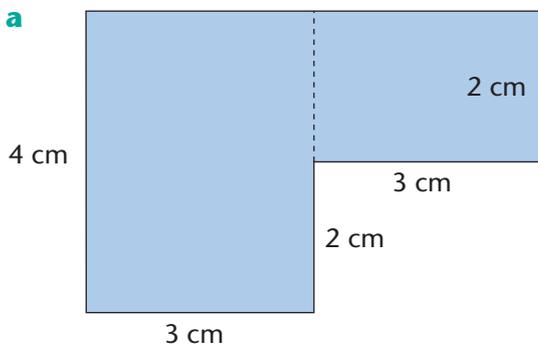
a A = (4 cm × 3 cm) + (3 cm × 2 cm)
= 12 cm² + 6 cm²
= 18 cm²

b A = (×) + (×)
=
= _____ cm²

c A = (×) + (×)
=
= _____ cm²

Factors

Factors are whole numbers that can be multiplied with another number to make a new number. For example: the factors of 18 are: 1, 2, 3, 6, 9 and 18.   (2 × 9 = 18   6 × 3 = 18   18 × 1 = 18)

1 Answer true or false.

a 6 is a factor of 18 _____   d 7 is a factor of 49 _____

b 6 is a factor of 15 _____   e 8 is a factor of 35 _____

c 6 is a factor of 24 _____   f 9 is a factor of 27 _____

2 List all the factors of the following numbers. The first one is done for you.

a	10	1, 2, 5, 10
b	12	
c	14	
d	16	
e	18	
f	20	
g	24	
h	30	
i	28	
j	40	
k	48	

The factors of 15 are 1, 3, 5, 15.

3 Use division to find the missing factors.

a 14
7 ◯

b 18
6 ◯

c 24
8 ◯

d 32
8 ◯

e 27
3 ◯

f 30
15 ◯

g 28
7 ◯

h 45
9 ◯

Identify and describe properties of prime, composite, square and triangular numbers

Understanding
N L

Percentages, fractions and decimals

A **percentage** is another way of recording a fraction with a denominator of 100 (out of 100). A percentage sign **%** is used to display percentages. For example, $\frac{25}{100}$ can be written as 25%.

4 Shade the squares to display the percentages.
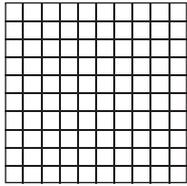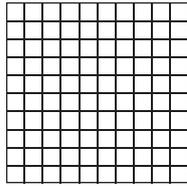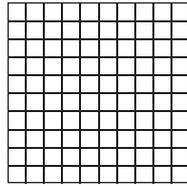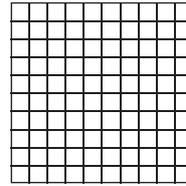
a 10% b 27% c 50% d 100% e 5%
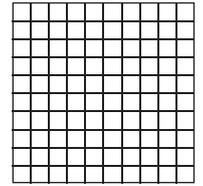
5 Fill in the missing cells on the equivalence tables.

	Visual	Fraction	Hundredths	Decimal	Percentage
a		$\frac{1}{10}$	$\frac{10}{100}$	0.	10%
b		$\frac{2}{10}$	$\frac{}{100}$	0.	%
c		$\frac{1}{4}$	$\frac{}{100}$	0.	%
d		$\frac{3}{10}$	$\frac{}{100}$	0.	%
e		$\frac{4}{10}$	$\frac{}{100}$	0.	%
f		$\frac{1}{2}$	$\frac{}{100}$	0.	%

	Visual	Fraction	Hundredths	Decimal	Percentage
g					
h		$\frac{7}{10}$			
i					
j				0.8	
k					90%
l		1			

6 Write each fraction or decimal as a percentage.

a $\frac{36}{100}$ _____ %   c $\frac{99}{100}$ _____ %   e 0.5 _____ %   g $\frac{7}{10}$ _____ %

b 0.74 _____ %   d 0.67 _____ %   f $\frac{1}{10}$ _____ %   h 0.9 _____ %

Square numbers

Square numbers are numbers that can be arranged in the shape of a square array. They are equal to a number multiplied by itself.

7 Complete the labels for the squared numbers.

1^2 2^2 3^2 4^2
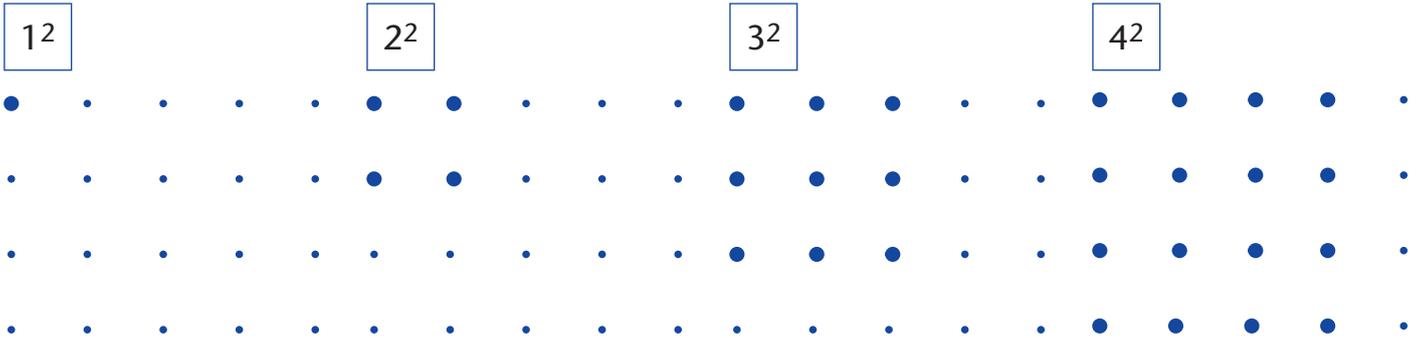
a $1 \times 1 = \boxed{}$ **b** $2 \times 2 = \boxed{}$ **c** $3 \times 3 = \boxed{}$ **d** $4 \times 4 = \boxed{}$

8 Model then complete the labels for 5^2, 6^2 and 7^2.

a 5^2

$\boxed{} \times \boxed{} = \boxed{}$

b 6^2

$\boxed{} \times \boxed{} = \boxed{}$

c 7^2

$\boxed{} \times \boxed{} = \boxed{}$
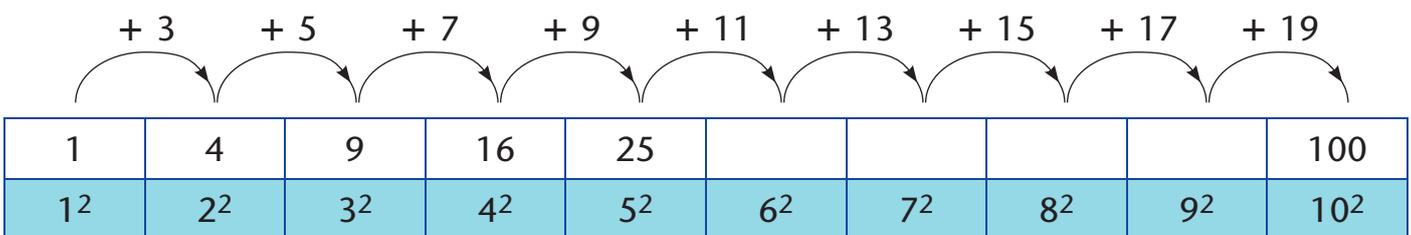
9 Sally said I can predict the next square number because square numbers go up in a pattern of odd numbers.

E.g. $\boxed{1}$ + 3 $\boxed{4}$ + 5 $\boxed{9}$ + 7 $\boxed{16}$

a Use the pattern below to find the next square number after 16. _____

b Use the pattern to complete the square numbers to 100.

+ 3	+ 5	+ 7	+ 9	+ 11	+ 13	+ 15	+ 17	+ 19

1	4	9	16	25					100
1^2	2^2	3^2	4^2	5^2	6^2	7^2	8^2	9^2	10^2

10 Use a calculator to square these numbers:

a $11^2 = $ _____   **b** $12^2 = $ _____   **c** $13^2 = $ _____   **d** $14^2 = $ _____   **e** $15^2 = $ _____

11 Draw a line to match the net and the three-dimensional object to its name.

Triangular pyramid

Hexagonal prism
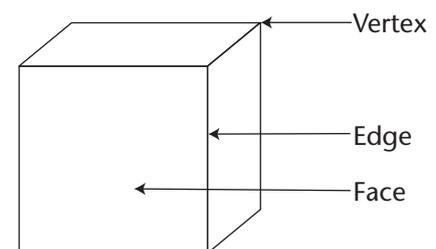
Triangular prism

Rectangular prism

Square pyramid

Cylinder

12 Classify the objects by stating the number of faces, edges and vertices on each.

	Object	Faces	Edges	Vertices
a	Triangular pyramid			
b	Hexagonal prism			
c	Triangular prism			
d	Rectangular prism			
e	Square pyramid			
f	Cylinder			

Vertex

Edge

Face

13 What am I?

a I am made from 4 triangles which are the same shape and a square.
I also have 5 vertices, 5 faces and 8 edges.

b I am made from 2 identical pentagons and 5 identical rectangles.
I also have 15 edges, 10 vertices and 7 faces.

767 books were shared between 5 schools.

Share out the hundreds with each school getting 1 hundred.	Trade the 2 hundreds left for 20 tens. Now share the 26 tens. Each school gets 5 tens.	Trade the 1 ten left over for 10 ones. Now share the 17 ones. Each school gets 3 and there is a remainder of 2.
$\dfrac{1}{5\,|\,7\ 6\ 7}$	$\dfrac{1\ 5}{5\,|\,7^26\ 7}$	$\dfrac{1\ 5\ 3r2}{5\,|\,7^26^17}$

1 Before completing each division operation write an estimate in the cloud of what you think the quotient will be.

a $3\,|\,4\ 2\ 6$ b $5\,|\,6\ 5\ 5$ c $6\,|\,7\ 8\ 6$ d $3\,|\,5\ 1\ 9$ e $2\,|\,7\ 6\ 8$

f $3\,|\,3\ 9\ 7$ g $4\,|\,2\ 4\ 7$ h $5\,|\,3\ 5\ 6$ i $6\,|\,3\ 7\ 2$ j $7\,|\,5\ 0\ 4$

k $5\,|\,7\ 5\ 7$ l $3\,|\,6\ 5\ 9$ m $6\,|\,2\ 6\ 9$ n $4\,|\,3\ 5\ 8$ o $7\,|\,4\ 5\ 7$

2 Ebony's little sister put white out on her homework. Use strategies such as backtracking to rewrite her work with the correct solutions.

a	$14\bigcirc \div 5 = 29$	
b	$564 \div \bigcirc = 141$	
c	$2\bigcirc 2 \div 6 = 42$	
d	$369 \div \bigcirc = 123$	
e	$\bigcirc 65 \div 5 = 53$	
f	$3\bigcirc \times 8 = 248$	
g	$\bigcirc 5 \times 6 = 270$	
h	$3\bigcirc \times 9 = 342$	

3 Create 4 different divisions that have a remainder of 2.

$\square\,|\,\square\ \square\ \square$ r2 $\square\,|\,\square\ \square\ \square$ r2 $\square\,|\,\square\ \square\ \square$ r2 $\square\,|\,\square\ \square\ \square$ r2

Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers

Reasoning, Problem solving
CCT N

Number patterns

4 Identify the number pattern in each table then answer the questions.

a Complete the table.

First number	1	2	3	4	5	6	7
Second number	9	10	11	12			

b Describe the pattern in the table.

_____

c What would be the 10th term in the pattern? _____

d Complete the table.

First number	1	2	3	4	5	6	7
Second number	3	6	9				

e Describe the pattern in the table.

_____

f What would be the 10th term in the pattern? _____

g Complete the table.

First number	1	2	3	4	5	6	7
Second number	9	18	27				

h Describe the pattern in the table.

_____

i What would be the 10th term in the pattern? _____

j Complete the table.

First number	1	2	3	4	5	6	7
Second number	18			21			24

k Describe the pattern in the table.

_____

l What would be the 10th term in the pattern? _____

m Complete the table.

First number	11	10	9	8	7	6	5
Second number	99			72			45

n Describe the pattern in the table.

_____

o What would be the 10th term in the pattern? _____
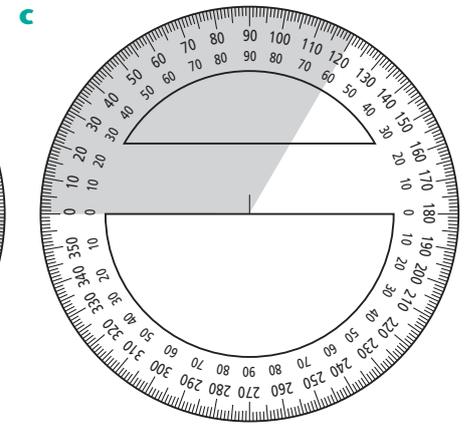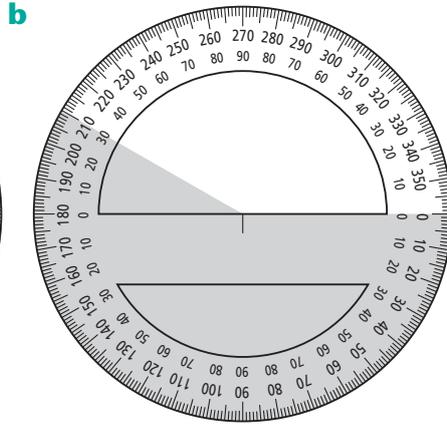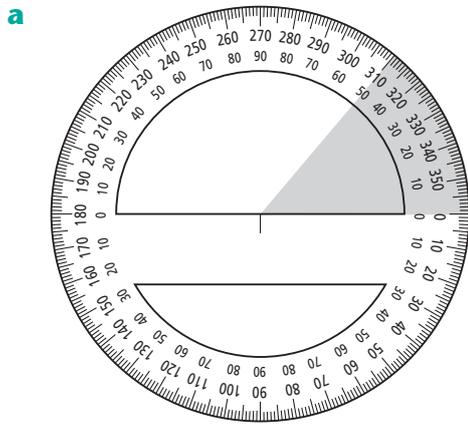
p Complete the table.

First number	27	37	47	57	67	77	87
Second number	14			44			74

q Describe the pattern in the table.

_____

r What would be the 10th term in the pattern? _____

5 Below each protractor record the angle formed by the shaded section.

a

b

c
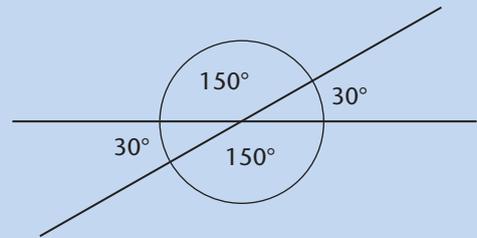
Shaded: _____   Shaded: _____   Shaded: _____

6 If you add the angles formed by the shaded section and the clear section what is the total?
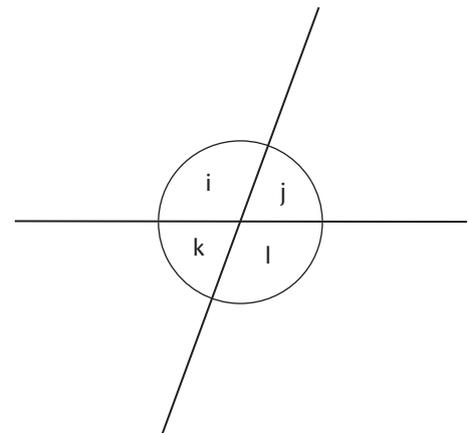
Intersecting lines
When two or more lines cross each other we call them intersecting lines.
Opposite angles are equal to each other.

150° 30°
30° 150°

7 Measure the angles at the vertex of these intersecting lines.
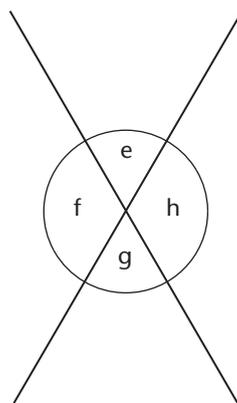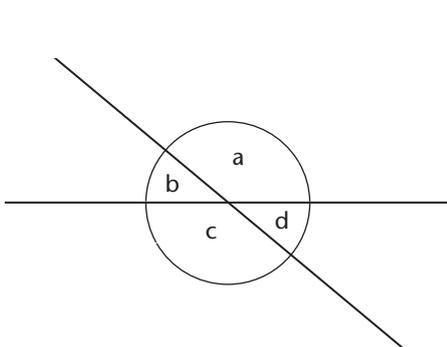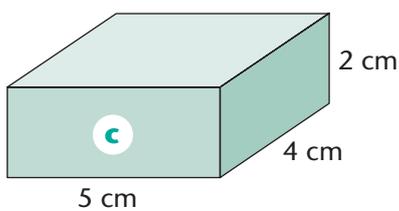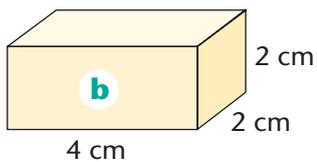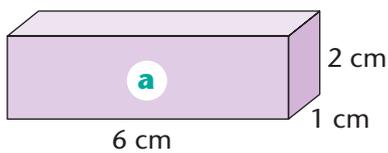
a b c d

e f g h

i j k l

Angle	a	b	c	d	e	f	g	h	i	j	k	l
Degree												

The base unit for measuring volume is the **cubic centimetre**, which is a cube measuring 1 cm on all sides. A centicube is a good example of a cubic centimetre.

1 cm
1 cm
1 cm
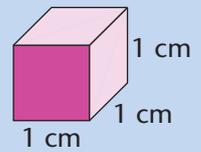
8 Construct these prisms using centicubes. Count how many are in each, then record the dimensions and volume of each prism in cubic centimetres on the table (cm^3).

a
2 cm
1 cm
6 cm
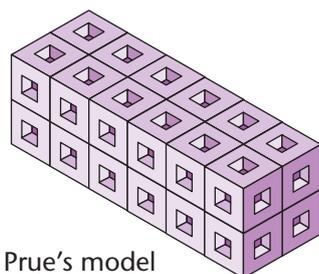
Shape	Length	Width	Height	Volume
a				cm^3
b				cm^3
c				cm^3
d				cm^3
e				cm^3

b
2 cm
2 cm
4 cm

c
2 cm
4 cm
5 cm

d
5 cm
3 cm
4 cm

e
5 cm
2 cm
6 cm
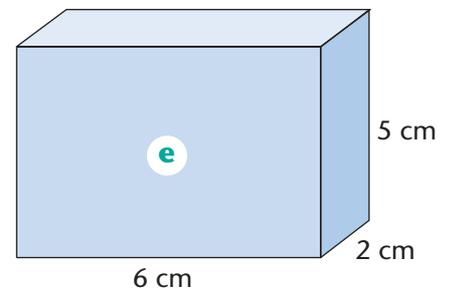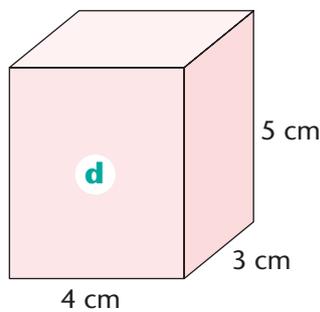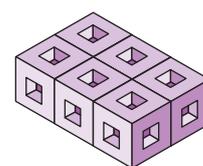
9 Did you notice any relationship between the length, width and height of the prism and its volume? What is the relationship?

_____

_____

10 **Equal volumes**

Prue has finished her model. Matt has only made the base of his model. How high will his model be if he is going to use the same number of cubes as Prue?

Prue's model

Matt's model

Matt's model will be _____ cubes high.

1 Find the answers through multiplication.

a $\frac{1}{2}$ of 18 pigs _____

b $\frac{1}{4}$ of 20 marbles _____

c $\frac{1}{5}$ of 35 pencils _____

d $\frac{1}{10}$ of 100 cattle _____

e $\frac{1}{10}$ of 70 children _____

f $\frac{1}{4}$ of 32 dogs _____

g $\frac{1}{8}$ of 32 lollies _____

h $\frac{1}{10}$ of $20 _____

i $\frac{1}{8}$ of $40 _____

j $\frac{1}{5}$ of 25 ducks _____

k $\frac{1}{6}$ of $42 _____

l $\frac{1}{7}$ of $63 _____

m $\frac{1}{8}$ of 72 cats _____

n $\frac{1}{8}$ of 48 marbles _____

> $\frac{1}{6}$ of 24 birds.
> $\frac{1}{6}$ means divide by 6.
> 6 whats are 24?
> 6 x 4 = 24.

2 Use multiplication facts and your knowledge of place value to answer these questions. For example 40 × 60 equals 4 tens × 6 tens which equals 24 hundreds (2400).

a 20 × 30 = _____

b 40 × 30 = _____

c 50 × 30 = _____

d 40 × 50 = _____

e 50 × 60 = _____

f 30 × 70 = _____

g 50 × 90 = _____

h 30 × 60 = _____

i 80 × 50 = _____

j 90 × 90 = _____

k 90 × 70 = _____

l 80 × 90 = _____

m 60 × 90 = _____

n 60 × 70 = _____

o 90 × 40 = _____

3 Mentally calculate the answers to these multiplications.

a 25 × 3 = _____

b 36 × 3 = _____

c 42 × 4 = _____

d 63 × 3 = _____

e 72 × 2 = _____

f 31 × 7 = _____

g 45 × 5 = _____

h 54 × 3 = _____

i 57 × 4 = _____

j 74 × 5 = _____

k 126 × 3 = _____

l 134 × 4 = _____

m 223 × 3 = _____

n 232 × 5 = _____

o 363 × 6 = _____

> 35 x 3?
> Think 3 x 30 + 3 x 5.
> 90 + 15 = 105

4 Use the skills you have learnt above to solve these problems.

a One fifth of a group of 45 children were sick. How many children were sick? _____

b Peter saved $25 per week for 7 weeks. How much did he save? _____

c Sarah saved $50 per week for 70 weeks. How much did she save? _____

d Trent lost one seventh of his marbles. If he had 56 to start with, how many were lost? _____

e Trevor needed to construct some paddocks on a farm. He needed to make 40 fences with a length of 50 m each. How many metres of fencing would he need? _____

f Kelly collected an average of 76 shells every time she went to the beach. If Kelly visited the beach 6 times, how many shells would she collect? _____

Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers

Problem solving, Understanding
CCT N

5 Complete the decimal subtraction algorithms. Remember to keep the decimal points in a straight line.

a
```
  9 5 . 3 6 m
− 4 2 . 3 4
_____
      .
```

b
```
  7 6 . 5 7 m
− 4 3 . 4 6
_____
      .
```

c
```
  8 7 . 8 7 m
− 2 5 . 3 6
_____
      .
```

d
```
  7 8 . 6 2 kg
− 6 3 . 4 5
_____
      .
```

e
```
  9 . 6 3 5 kg
− 4 . 2 3 4
_____
    .
```

f
```
  3 . 4 5 7 m
− 1 . 2 3
_____
    .
```

g
```
  6 . 5 8 9 m
− 2 . 3 0 6
_____
    .
```

h
```
  8 . 7 3 4 kg
− 4 . 2 5
_____
    .
```

6 A group of 11-year-old children recorded their mass at the Technology Park.

I'm almost 40 kg.

Name	Mass
Will	32 kg
Ellen	29.8 kg
Connie	30.5 kg
Frank	29.585 kg
George	35.005 kg
Alice	36 kg

Calculate the difference in mass between:

a Will / Ellen

b Connie / Frank

c Ellen / Frank

d Alice / George

7 Solve these problems.

a Peter's mass is 47.515 kg and Kim's mass is 36.49 kg. What is the difference in their masses?

b Jill can run 76.34 m in 10 seconds and Lauren can run 73.55 m in 10 seconds. How much further can Jill run in 10 seconds?

c Kelly saved $337.80 but spent $229.50 on a CD. How much did she have left?

d Garry needed to cut a 4.755 m piece of timber from a 6-m length. How much timber was left over?

e Karo is 1.372 m tall. How tall will she be by the end of next year if she grows another 0.09 m?

f Danielle wanted to cut 4 lengths of timber measuring 1.675 m each from a length of timber measuring 6.5 m. Is it possible for Danielle to do this?

Rotational symmetry

What is line symmetry?
A shape has **line symmetry** if both its parts match
when it is folded along a line.
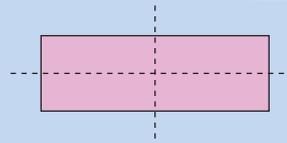
8 How many lines of symmetry does each shape have?

a   b   c   d   e   f
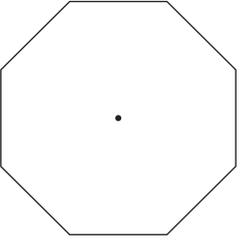
9 Use the line of symmetry to help you draw the other half of the shapes.

a   b   c   d

What is rotational symmetry?
A shape has **rotational symmetry** if, after the shape is turned around its centre point,
it matches the original shape more than once through a full rotation.

10 Colour all shapes that have rotational symmetry. You may need to trace the shapes
and pin them to discover the answers.
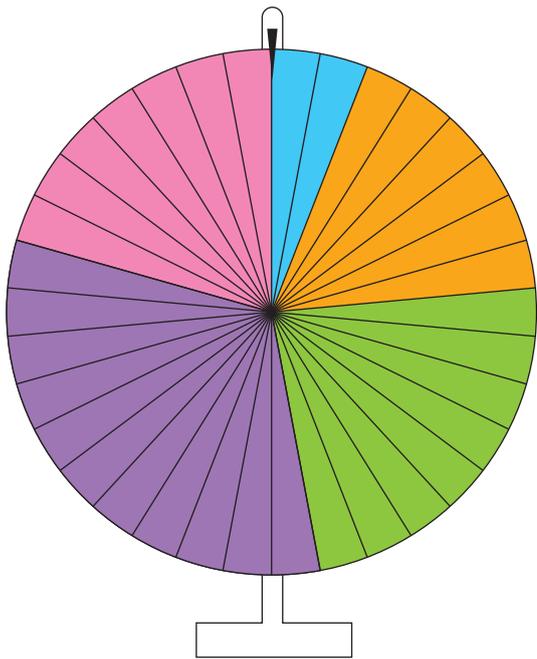
a   b   c   d

e   f   g   h

When fractions are used to describe the chance of an event happening, the total of all the fractions must equal 1.

B **R** **B** **Y** **B**

The chance of selecting a blue marble from the bag is 3 out of 5 chances ($\frac{3}{5}$).

11 Our teacher made a chocolate wheel that was divided into 34 parts. Study the picture of the chocolate wheel to state, as a fraction, the chance of each colour being spun.

a blue   **c** orange   **e** purple
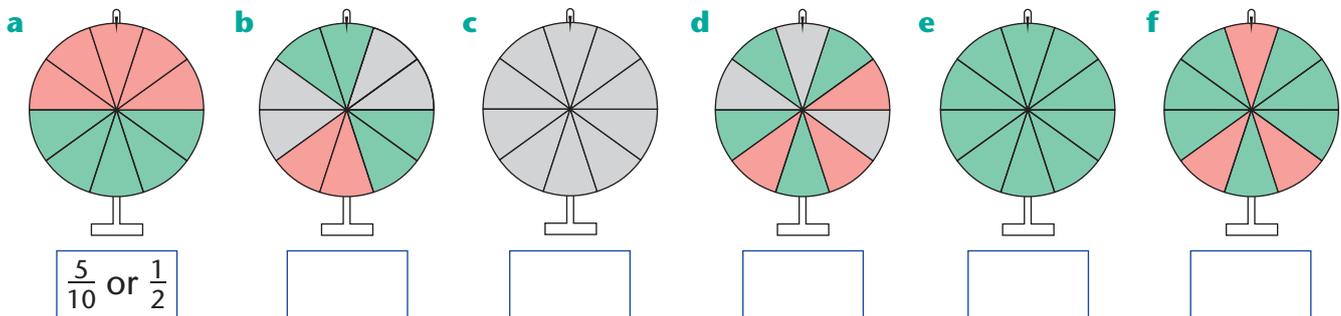
b green   **d** pink

f Are you more likely to spin pink than orange? _____

g Are you more likely to spin an odd or even number if you spin pink? _____
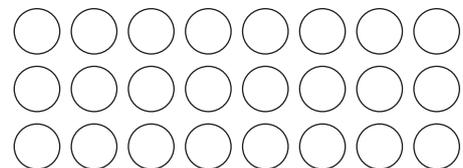
h If the colours were separated and not grouped together, would it change the likelihood of a colour being selected? _____

12 Rate the likelihood of green being the winning colour on these chocolate wheels using fractions.

a   **b**   **c**   **d**   **e**   **f**

$\frac{5}{10}$ or $\frac{1}{2}$

13 Colour the balls to match the fractional chances.

a blue $\frac{1}{4}$ **c** red $\frac{1}{12}$ **e** pink $\frac{1}{6}$

b green $\frac{3}{8}$ **d** yellow $\frac{1}{8}$

14 Describe an event to match each likelihood.

a 0 _____

b $\frac{1}{10}$ _____

c $\frac{1}{2}$ _____

d $\frac{10}{10}$ _____

Subtraction of whole numbers

1 Complete the subtraction algorithms. In some cases you will have to fill in the empty boxes.

a
```
  6 5 9 3 4
− 3 4 1 2 3
```

b
```
  9 6 7 8 4
− 4 4 5 8 2
```

c
```
  7 4 1 8 3
− 5 3 0 7 2
```

d
```
  8 7 2 2 8
− 6 2 1 4 8
```

e
```
  9 4 9 9 6
− 7 8 6 0 7
```

f
```
  8 3 4 0 8
− 6 2 7 6 1
```

g
```
  7 9 6 7 5
− 5 2 9 0 8
```

h
```
  8 8 7 9 6
− 4 3 5 6 7
```

i
```
  5 7 3 9 6
−   8 4 7 5
```

j
```
  9 9 5 9 5
− 3 4 9 3 2
```

k
```
  4 □ □ 8 6
− 2 6 4 0 5
  1 7 4 □ □
```

l
```
  6 □ □ 4 9
− 3 3 8 2 1
  □ 3 6 □ □
```

m
```
  5 5 □ 8 □
− 2 3 7 2 8
  □ □ 5 5 4
```

n
```
  7 □ 8 1 2
− 5 4 □ 1 □
  □ 3 7 9 8
```

o
```
  8 9 4 4 6
− 4 8 □ □ 1
  □ □ 3 5 □
```

The tables below show the area of 15 different countries in square kilometres.

Country	Area (sq km)
Australia	7 686 830
Brazil	8 511 965
Canada	9 976 140
China	9 596 960
Egypt	1 001 450

Country	Area (sq km)
Fiji	18 270
France	547 030
Germany	357 021
Hungary	93 030
India	3 287 590

Country	Area (sq km)
Italy	301 230
New Zealand	268 680
United Kingdom	244 820
United States	9 629 091
Vietnam	329 560

2 Use the tables to calculate the difference in area between these countries. The first one has been started for you.

a
Country	Area (sq km)
Australia	7 686 830
New Zealand	268 680
Difference	

b
Country	Area (sq km)
Canada	
Australia	
Difference	

c
Country	Area (sq km)
China	
Australia	
Difference	

3 Select your own countries and calculate the difference in size between them.

a
Country	Area (sq km)
Difference	

b
Country	Area (sq km)
Difference	

c
Country	Area (sq km)
Difference	

4 What country am I thinking of?

I am

My area is less than Germany but more than New Zealand. The difference between my area and that of the United Kingdom is 84 740.

Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers

Fluency, Problem solving
CCT L N

Improper fractions have numerators larger than their denominators.

E.g. $\frac{5}{4}, \frac{7}{5}, \frac{9}{4}, \frac{6}{5}, \frac{10}{9}$

A **mixed number** consists of a whole number and a fraction.

E.g. $1\frac{1}{2}, 2\frac{1}{4}, 1\frac{3}{4}, 2\frac{4}{5}, 7\frac{1}{10}$
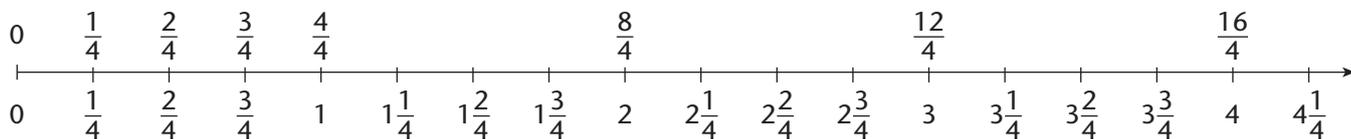
This diagram can be viewed as both $\frac{5}{4}$ and $1\frac{1}{4}$.

5 Write an improper fraction and a mixed number for each set of modelled shapes.

Models	Improper fraction	Mixed number
a		
b		
c		
d		

6 Use the number line to write an improper fraction for the mixed numbers.

Number line top: $0 \quad \frac{1}{4} \quad \frac{2}{4} \quad \frac{3}{4} \quad \frac{4}{4} \quad \frac{8}{4} \quad \frac{12}{4} \quad \frac{16}{4}$

Number line bottom: $0 \quad \frac{1}{4} \quad \frac{2}{4} \quad \frac{3}{4} \quad 1 \quad 1\frac{1}{4} \quad 1\frac{2}{4} \quad 1\frac{3}{4} \quad 2 \quad 2\frac{1}{4} \quad 2\frac{2}{4} \quad 2\frac{3}{4} \quad 3 \quad 3\frac{1}{4} \quad 3\frac{2}{4} \quad 3\frac{3}{4} \quad 4 \quad 4\frac{1}{4}$

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

b $1\frac{3}{4} =$

c $2\frac{3}{4} =$

d $3\frac{2}{4} =$

e $3\frac{1}{4} =$

f $4\frac{1}{4} =$

g $2\frac{1}{4} =$

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

7 Write a mixed number that has the same value as the improper fraction.

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

b $\frac{7}{4} =$

c $\frac{9}{4} =$

d $\frac{6}{4} =$

e $\frac{10}{4} =$

f $\frac{15}{4} =$

g $\frac{13}{4} =$

h $\frac{17}{4} =$

To convert an improper fraction to a mixed number divide the numerator by the denominator.

8 Convert each improper fraction to a mixed number.

a $\frac{7}{5} =$

b $\frac{9}{6} =$

c $\frac{5}{3} =$

d $\frac{6}{5} =$

e $\frac{5}{4} =$

f $\frac{7}{4} =$

g $\frac{7}{6} =$

h $\frac{9}{8} =$

i $\frac{11}{8} =$

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

k $\frac{8}{3} =$

l $\frac{9}{4} =$

m $\frac{10}{3} =$

n $\frac{10}{4} =$

o $\frac{11}{5} =$

p $\frac{13}{8} =$

9 Year 6 conducted a survey of how 100 students in their year travel to school. Add the columns to the graph using the data below.

a $\frac{1}{4}$ catch the bus.

b 0.21 travel by car.

c 24% walk to school.

d 12% ride bikes to school.

e 0.18 of the survey group catch the train.

Use the data to answer these questions.

f Which form of transport is least popular? _____

g How many walk to school? _____

h What form of transport represents the median? _____

i What form of transport represents the mode? _____

Transport to school

Number of students (y-axis: 0 to 25)

Type of transport: bike | train | car | walk | bus
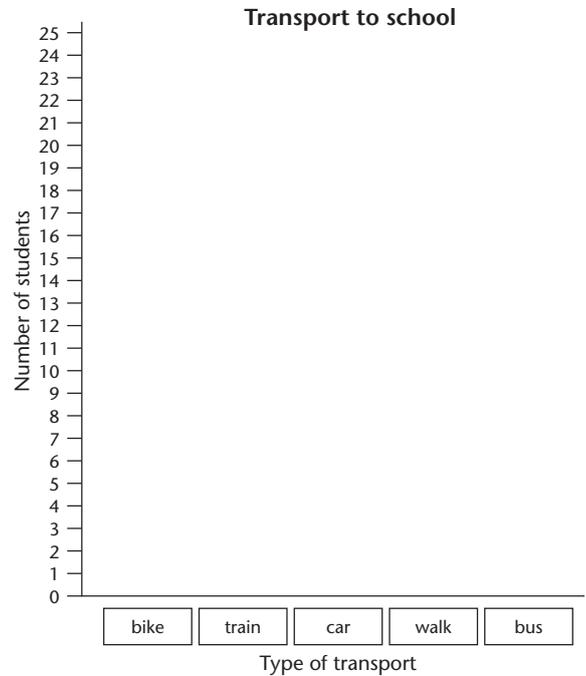
10 In a group conduct your own survey of 50 students to see how they travel to school. Record your survey results in a frequency table and then construct a graph to illustrate your data.

Before you start decide if you will count only the main type of transport students use or include all types of transport. E.g. Susan walks about 50 metres to the bus-stop and then catches the bus for about 5 km. In this case you have to decide whether or not to include 'walking' as part of your data.

Transport type	Tally	Frequency

Transport to school
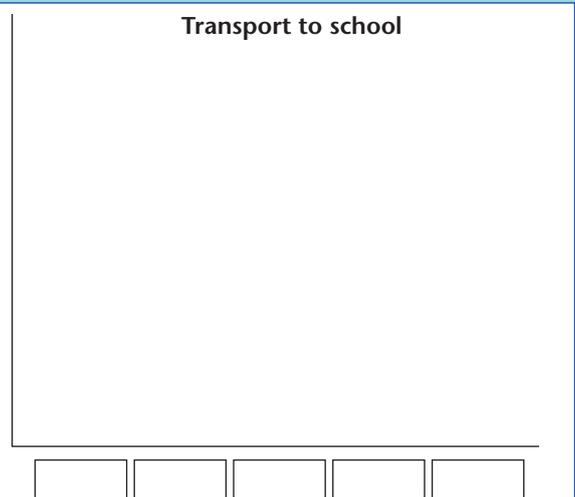
11 Compare your data with the data at the top of the page and make some statements about how the forms of transport differ and why.

_____

_____

24 Interpret and compare a range of data displays, including side-by-side column graphs for two categorical variables

Reasoning, Problem solving
CCT N

Time can be expressed in a 12-hour am/pm form, or as 24-hour time.

| am | | | | | | | | | | | | | pm | | | | | | | | | | | |

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

0100 0300 0500 0700 0900 1100 Noon 1300 1500 1700 1900 2100 2300
0000 0200 0400 0600 0800 1000 1200 1400 1600 1800 2000 2200 2400
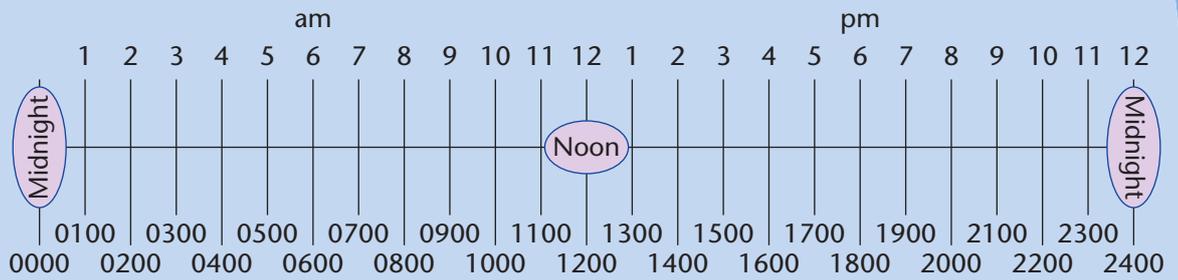
12 A security guard has to be at the following destinations at the given times. Write 24-hour times on his timetable to help him achieve his goal.

	24-hour	Digital	Destination
a		9:50 am	Toowong
b		10:30 am	Milton
c		11:22 am	Hamilton
d		12:07 pm	Ascot
e		1:25 pm	Bulimba
f		2:54 pm	Carindale
g		3:25 pm	Chandler
h		4:36 pm	Rochedale
i		6:54 pm	Burbank
j		8:06 pm	Cleveland

13 Answer the questions in 24-hour time.

a If he arrived at Hamilton 9 minutes early, what time would it be? _____

b If he arrived at Carindale 12 minutes late, what time would it be? _____

c If he arrived at Cleveland at the correct time and was there for 26 minutes, at what time would he be ready to leave? _____

CHANNEL 2
6:00 Business Breakfast
8:30 Sesame Street
9:00 Bananas in Pyjamas
10:00 The Word Machine
11:00 Science Bank II
12:00 World at Noon
2:30 The Hoobs
3:30 Play School
4:00 Arthur
4:30 Cyberchase
5:00 Angela Anaconda
5:30 Horrible Histories
6:00 Rolf Harris Animal Hospital
6:30 New Dimensions
7:00 ABC News
7:30 Reality Bites
9:00 MDA
10:00 Lateline
11:00 Movie: Room Service

Televisions use 24-hour time to record programs.

14 Display the starting time and finishing time of each program in 24-hour time as well as the duration of each program.

	Program	Start	Finish	Duration
a	Sesame Street	0830	0900	30 min
b	Business Breakfast			
c	ABC News			
d	Bananas in Pyjamas			
e	Reality Bites			
f	Lateline			
g	The Hoobs			
h	World at Noon			

Add and subtract fractions

1 Subtract the fractions.

a $\frac{11}{12} - \frac{4}{12} =$

b $\frac{9}{12} - \frac{6}{12} =$

c $\frac{10}{12} - \frac{7}{12} =$

d $\frac{9}{10} - \frac{3}{10} =$

e $\frac{8}{10} - \frac{5}{10} =$

f $\frac{7}{8} - \frac{4}{8} =$

g $\frac{11}{12} - \frac{7}{12} =$

h $\frac{9}{12} - \frac{5}{12} =$

i $\frac{7}{10} - \frac{6}{10} =$

j $\frac{5}{6} - \frac{2}{6} =$

k $\frac{3}{4} - \frac{1}{4} =$

l $\frac{9}{10} - \frac{7}{10} =$

m $\frac{5}{6} - \frac{4}{6} =$

n $\frac{8}{10} - \frac{4}{10} =$
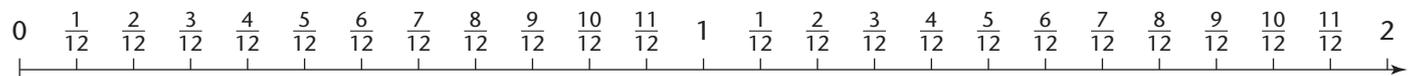
o $\frac{11}{12} - \frac{10}{12} =$

Subtracting fractions with common denominators is easy.
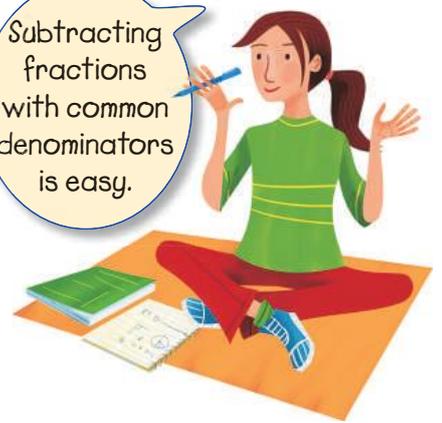
2 Use 2 different colours to add the fractions on the diagrams then record your answers below as an improper fraction and a mixed number. The first one is done for you.

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

d $\frac{4}{6} + \frac{3}{6} = \quad =$

b $\frac{7}{10} + \frac{6}{10} = \quad =$

e $\frac{3}{4} + \frac{3}{4} = \quad =$

c $\frac{7}{8} + \frac{5}{8} = \quad =$

f $\frac{7}{12} + \frac{6}{12} = \quad =$

$0 \quad \frac{1}{12} \quad \frac{2}{12} \quad \frac{3}{12} \quad \frac{4}{12} \quad \frac{5}{12} \quad \frac{6}{12} \quad \frac{7}{12} \quad \frac{8}{12} \quad \frac{9}{12} \quad \frac{10}{12} \quad \frac{11}{12} \quad 1 \quad \frac{1}{12} \quad \frac{2}{12} \quad \frac{3}{12} \quad \frac{4}{12} \quad \frac{5}{12} \quad \frac{6}{12} \quad \frac{7}{12} \quad \frac{8}{12} \quad \frac{9}{12} \quad \frac{10}{12} \quad \frac{11}{12} \quad 2$

3 Use the number line to add the fractions.

a $\frac{8}{12} + \frac{5}{12} = \quad =$

b $\frac{9}{12} + \frac{7}{12} = \quad =$

c $\frac{8}{12} + \frac{7}{12} = \quad =$

d $\frac{9}{12} + \frac{6}{12} = \quad =$

e $\frac{10}{12} + \frac{9}{12} = \quad =$

f $\frac{11}{12} + \frac{7}{12} = \quad =$

g $\frac{7}{12} + \frac{5}{12} = \quad =$

h $\frac{8}{12} + \frac{9}{12} = \quad =$

i $\frac{9}{12} + \frac{9}{12} = \quad =$

4 How many questions can you write that have an answer of $1\frac{7}{12}$?
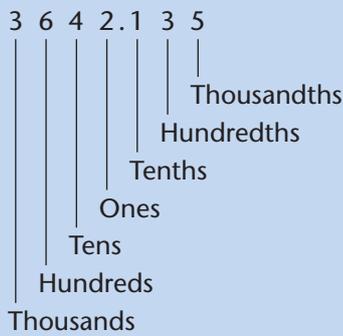
5 State the place value of each bold digit.

a	77.4**9**8	_____	g	345.45**6** _____
b	7**7**.654	_____	h	1**2**22.54 _____
c	288.**6**74	_____	i	26.**9**84 _____
d	3**5**4.876	_____	j	136.7**8**6 _____
e	**7**90.245	_____	k	**2**346.354 _____
f	**2**228.42	_____	l	4567.78**2** _____

Decimal place value

3 6 4 2.1 3 5

- Thousandths
- Hundredths
- Tenths
- Ones
- Tens
- Hundreds
- Thousands

6 Complete the table which shows how measurements such as centimetres can be expressed as common fractions and decimal fractions of a metre.

	Centimetres	Fraction of a metre	Decimal fraction
a	10 cm	$\frac{10}{100}$	0.1 m
b	90 cm		
c	70 cm		
d	80 cm		
e	30 cm		

	Centimetres	Fraction of a metre	Decimal fraction
f	150 cm		
g	520 cm		
h	350 cm		
i	210 cm		
j	825 cm		

520 cm is the same as 5.2 metres or $5\frac{2}{10}$ metres.

7 Use your knowledge of place value to order each set of decimals from smallest to largest.

a	0.65 m	0.8 m	0.36 m	0.75 m
b	0.071 km	0.7 km	0.92 km	0.973 km
c	3.512 L	3.05 L	3.005 L	3.26 L
d	0.352 kg	0.007 kg	0.5 kg	0.48 kg
e	7.63	8.36	9.013	35.65
f	2.003	3.002	3.2	1.979

8 Continue the decimal number patterns.

a	0.12	0.15	0.18			

b	0.16	0.2	0.24			

c	0.27	0.33	0.39			

d	1.17	1.2	1.23			

e	2.39	2.43	2.47			

f	5.67	5.7	5.73			

Representing three-dimensional objects

When drawing three-dimensional objects we often use dotted lines to show the hidden edges. This allows us to view all the faces, edges and vertices of an object.

9 Put dotted lines in the following drawings to show the hidden detail (faces, edges and vertices).

a	**b**	**c**	**d**

10 Study the objects, then draw them. Always draw lightly first, then firmly later so trial and error mistakes don't show.

a	**b**	**c**	**d**
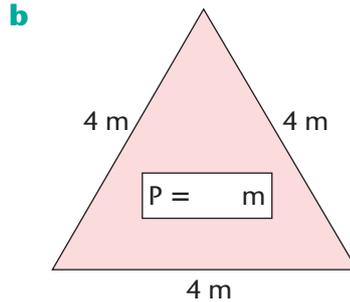
11 Another way to represent depth in three-dimensional drawings is to draw them isometrically. Draw the prisms on the isometric dot paper. The back block has been drawn for you.

a   b   c   d

a   b   c   d

Shortcuts can be used to find the perimeter of some polygons.
E.g. The perimeter of a square with sides of 3 cm can be found by
multiplying the sides by 4. (3 cm × 4 = 12 cm)

3 cm
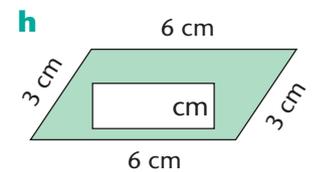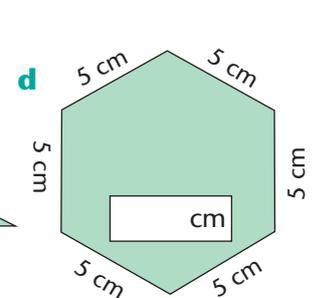
12 Calculate and record the perimeter of each triangle.

a

4 m   3 m

P =   m

5 m

b

4 m   4 m

P =   m

4 m

c

5 m

2 m   P =   m

5 m
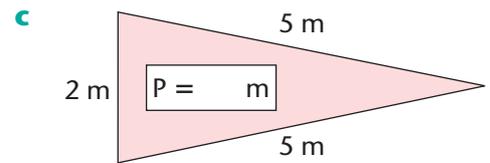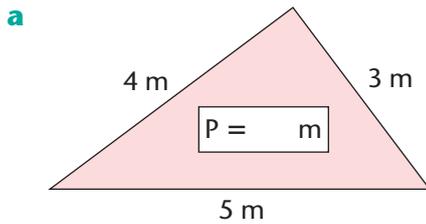
13 Can you see a shortcut method to find the perimeter of any of the triangles?

14 Calculate and record the perimeter of each polygon on the shape.

a

3 cm   3 cm

3 cm

3 cm

cm

3 cm

b

8 cm

4 cm

cm

8 cm

c

3 cm

2 cm

5 cm

cm

7 cm

4 cm

9 cm

d

5 cm   5 cm

5 cm

cm

5 cm

5 cm   5 cm

e

3 m   4 m

5 m

m

3.5 m

6 m

f

7 cm

7 cm   7 cm

7 cm   cm   7 cm

7 cm

7 cm   7 cm

g

5 m

m

3 m

4 m

h

6 cm

3 cm   cm   3 cm

6 cm
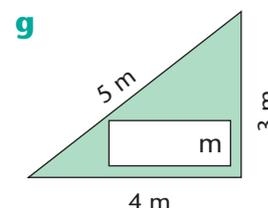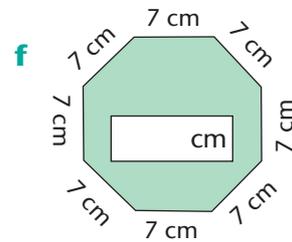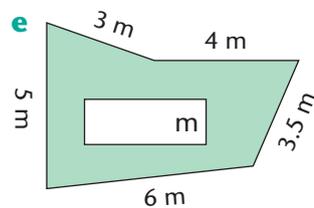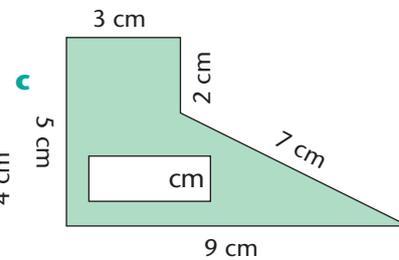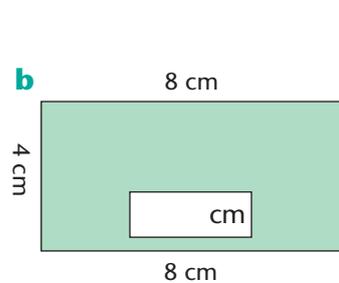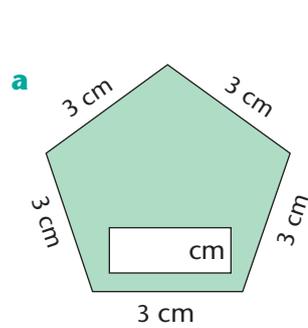
15 On which polygons above is it appropriate to use a shortcut to find the perimeter?

16 Calculate the perimeter of these shapes.

		Perimeter
a	A regular hexagon with sides of 8 centimetres.	
b	An equilateral triangle with sides of 5 centimetres.	
c	A regular decagon with sides of 10 centimetres.	

17 Describe a regular polygon that has a perimeter of 40 centimetres.

4-digit × 1-digit multiplication

Sometimes trading is needed when multiplying.

Thous	Hund	Tens	Ones
1	1	1	
2	6	4	5
×			3
7	9	3	5

- 5 × 3 = 15
  Write 5 in the ones column and trade the 10 ones for 1 ten.
- 4 tens × 3 equals 12 tens plus 1 ten equals 13 tens. Trade the 10 tens for 1 hundred. Write the 3 in the tens column.
- 6 hundreds × 3 equals 18 hundreds plus 1 hundred equals 19 hundreds. Trade the 10 hundreds for 1 thousand. Write the 9 in the hundreds column.
- 2 thousands × 3 equals 6 thousands plus 1 thousand equals 7 thousands. Write the 7 in the thousands column.

1 Complete the multiplications.

a
$$\begin{array}{r} 5\ 7\ 6\ 8 \\ \times\ \ \ \ \ \ \ 3 \\ \hline \end{array}$$

b
$$\begin{array}{r} 5\ 7\ 4\ 3 \\ \times\ \ \ \ \ \ \ 4 \\ \hline \end{array}$$

c
$$\begin{array}{r} 2\ 7\ 6\ 5 \\ \times\ \ \ \ \ \ \ 3 \\ \hline \end{array}$$

d
$$\begin{array}{r} 6\ 9\ 5\ 8 \\ \times\ \ \ \ \ \ \ 2 \\ \hline \end{array}$$

e
$$\begin{array}{r} 7\ 5\ 4\ 7 \\ \times\ \ \ \ \ \ \ 5 \\ \hline \end{array}$$

f
$$\begin{array}{r} 6\ 0\ 2\ 4 \\ \times\ \ \ \ \ \ \ 6 \\ \hline \end{array}$$

g
$$\begin{array}{r} 4\ 2\ 8\ 9 \\ \times\ \ \ \ \ \ \ 5 \\ \hline \end{array}$$

h
$$\begin{array}{r} 4\ 8\ 0\ 6 \\ \times\ \ \ \ \ \ \ 7 \\ \hline \end{array}$$

i
$$\begin{array}{r} 8\ 6\ 5\ 4 \\ \times\ \ \ \ \ \ \ 8 \\ \hline \end{array}$$

j
$$\begin{array}{r} 3\ 5\ 7\ 4 \\ \times\ \ \ \ \ \ \ 8 \\ \hline \end{array}$$

2 Guess and then check what the missing multipliers are in these multiplications.

a
$$\begin{array}{r} 3\ 0\ 9\ 6 \\ \times\ \ \ \ \bigcirc \\ \hline 2\ 7\ 8\ 6\ 4 \end{array}$$

b
$$\begin{array}{r} 6\ 0\ 2\ 7 \\ \times\ \ \ \ \bigcirc \\ \hline 4\ 8\ 2\ 1\ 6 \end{array}$$

c
$$\begin{array}{r} 3\ 2\ 4\ 2 \\ \times\ \ \ \ \bigcirc \\ \hline 2\ 2\ 6\ 9\ 4 \end{array}$$

d
$$\begin{array}{r} 6\ 0\ 9\ 8 \\ \times\ \ \ \ \bigcirc \\ \hline 3\ 0\ 4\ 9\ 0 \end{array}$$

e
$$\begin{array}{r} 7\ 2\ 0\ 3 \\ \times\ \ \ \ \bigcirc \\ \hline 6\ 4\ 8\ 2\ 7 \end{array}$$

3 Solve the problems.

a	Ms Cook has 5 bank accounts with $457 in each. How much does she have altogether?	
b	Mr Costello runs 4536 m each day. How far will he run in 7 days?	
c	Sarah runs 8250 m every day. If she is meant to run 60 km every week, how much further does she need to run?	
d	Alex saves $33.50 each month. Will she have enough to buy a $307 CD player after 9 months?	

4 Use the five different number cards to create then answer different multiplications.

[1] [2] [3] [5] [6]

a ☐☐☐☐ × ☐

b ☐☐☐☐ × ☐

c ☐☐☐☐ × ☐

d ☐☐☐☐ × ☐

5 Complete these additions and subtractions.

a
```
    5 4 6 7 7
    3 7 2 8 5
 +  2 5 6 2 8
 _____
```

b
```
    8 5 2 9 6
    4 6 9 7 4
 +  4 2 3 7 8
 _____
```

c
```
    4 7 5 2 1
    7 3 1 8 7
 +  2 7 2 4 3
 _____
```

d
```
    9 4 3 8 7
    8 8 6 5 2
 +  4 5 2 1 6
 _____
```

e
```
    7 8 3 9 2
    2 4 2 0 5
 +  5 2 8 1 7
 _____
```

f
```
    8 5 7 9 2
 −  2 8 7 2 6
 _____
```

g
```
    3 8 4 7 8
 −  1 9 3 4 7
 _____
```

h
```
    5 6 3 2 4
 −  2 5 2 0 8
 _____
```

i
```
    4 2 5 1 3
 −  3 7 5 1 9
 _____
```

j
```
    7 8 8 3 9
 −  4 2 5 6 7
 _____
```

6 Courtney has won a charity raffle and has $100 000 to spend. Use your calculator to work out which of these 5 items can be bought with exactly $100 000.

Car	Ring	Necklace	Jet ski	Motorcycle
$32 450	$3500	$88 000	$10 000	$12 300

Sunglasses	Guitar	Speedboat	Holiday	Pool
$150	$950	$23 100	$8750	$32 000

The five objects are: _____

7 Emma and Chris are buying a new house. Read the information and then explain which house you think they should buy.

Facts

• $29 960 in bank

• Can borrow about $115 000

• Both are earning about $50 000 per year

• Two children at primary school

What they want

• Three or four bedroom house

• Double garage

• Two bathrooms

• Pool or space for pool

• Close to schools

FOR SALE $145,000

A must to inspect

Koala Bay
$129 900

Five-year-old home.
Three bedrooms.
Renovated bathroom.
Small, neat yard.
Excellent views of bay.

Riverview Heights
$179 950

Brand new home.
Huge rumpus room.
Four bedrooms.
Landscaped yard with pool.
Double garage.

Dundee
$139 990

Urgent sale.
Owner going overseas.
Spacious three-bedroom home. Triple garage—great for parties by the pool. Extensions including second bathroom not yet complete.

Pleasant Valley
$145 000

Four-bedroom home.
Ensuite to main bedroom. Double garage, lovely yard with a great pool.
Move in straight away!
Not a cent to spend.

The most suitable house would be: _____

Problem solving, Reasoning
CCT N PSC

Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers

31

Triangular numbers

8 Complete the pattern for the first 17 triangular numbers. It has been started for you.

$$\begin{array}{l} 1 \\ 3 \\ 6 \\ 10 \end{array} \quad \begin{array}{l} +2 \\ +3 \\ +4 \end{array}$$

> Ten is a triangular number.

9 Look for a pattern in the triangular numbers above then write what the:

a 18th triangular number would be _____.   **c** 20th triangular number would be _____.

b 19th triangular number would be _____.   **d** 21st triangular number would be _____.

Pascal's triangle is an interesting number pattern that was developed by Blaise Pascal, a French mathematician.

Pascal's Triangle

```
            1
          1   1
        1   2   1
      1   3   3   1
    1   4   6   4   1
  1   5  10  10   5   1
1   6  15  20  15   6   1
```

10 Study how the number pattern goes together then complete the last two lines yourself.

11 The pattern of triangular numbers can be found in Pascal's triangle. Start at the shaded 1 on the third line and shade the diagonal that displays triangular numbers.

12 Circle the diagonal of counting numbers. E.g. 1, 2, 3, 4

Fibonnacci's Sequence is a pattern of numbers found by adding the previous number. E.g. 1, 1, 2, 3, 5, 8, 13

13 Continue the pattern.

1	1	2	3	5	8	13			

Identify and describe properties of prime, composite, square and triangular numbers

Problem solving, Reasoning
N L

14 Mr and Mrs Taylor and their children travel 400 km every year for their annual holidays.

a How long does the trip take them? ☐ hrs

b How far do they travel after 1 hour? ☐ km

c For how long do they stop on their way? ☐ hrs

d How far do they travel after 2 hours? ☐ km

e If they leave at 5 am, what time would they arrive at their destination? ☐

f How far do they travel in $4\frac{1}{2}$ hours? ☐ km

g If they leave at 5 am, what would be the time after they have travelled 250 km? ☐

The Taylors' family holiday
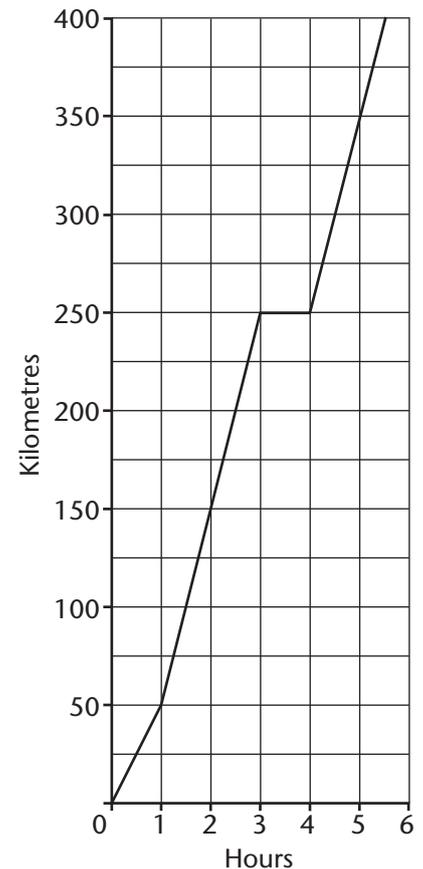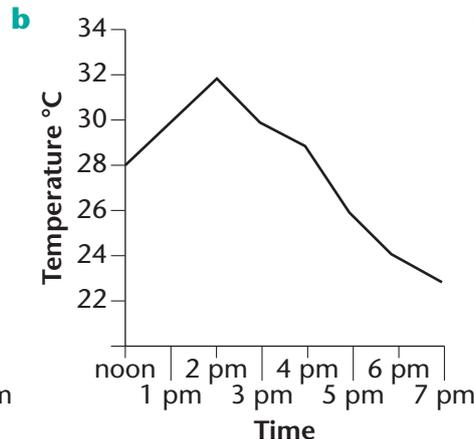
15 **a** If the Australia Post van travelled at 100 km/h over the same journey how much time would it save? _____

b Draw another line graph over the top of the Taylors' to show the Australia Post van's journey.

16 Peta recorded the temperature every hour from noon to 7 pm.

Time	Noon	1 pm	2 pm	3 pm	4 pm	5 pm	6 pm	7 pm
Temperature	28°C	30°C	32°C	30°C	29°C	26°C	24°C	23°C

Which graph represents Peta's data? ☐

a

b

c

Division strategies
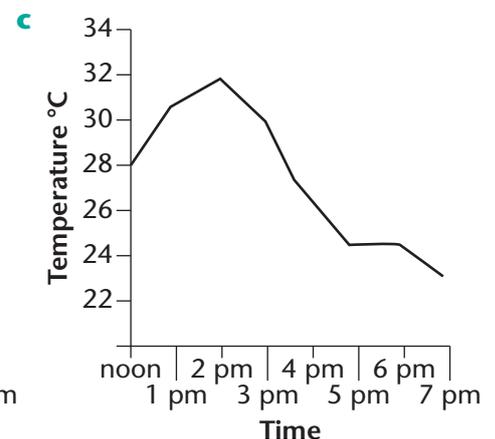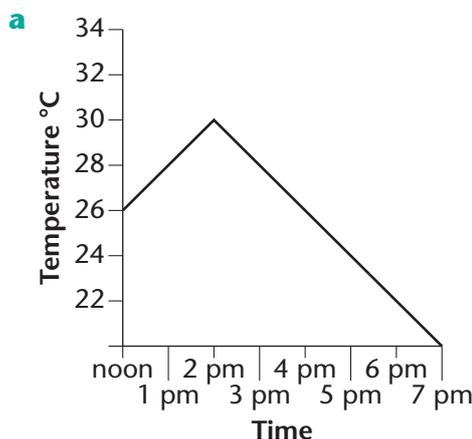
2673 sheep shared among 5 paddocks.

Share 26 hundreds among 5. Each paddock gets 5 hundreds.	Trade the 1 hundred left over for 10 tens. Now share the 17 tens. Each paddock gets 3 tens.	Trade the 2 tens left over for 20 ones. Now share the 23 ones. Each paddock gets 4 ones. There is a remainder of 3.
$\begin{array}{r} 5 \\ \hline 5\,)\,2673 \end{array}$	$\begin{array}{r} 5\ 3 \\ \hline 5\,)\,26^{1}73 \end{array}$	$\begin{array}{r} 5\ 3\ 4r3 \\ \hline 5\,)\,26^{1}7^{2}3 \end{array}$

1 Find the solutions.

a $5\,)\,2655$ b $6\,)\,3786$ c $4\,)\,2728$ d $4\,)\,3964$ e $6\,)\,4026$

f $5\,)\,2754$ g $6\,)\,2777$ h $6\,)\,2926$ i $5\,)\,3775$ j $4\,)\,2675$

2 Guess and then check to see what the missing divisors are in these divisions.

a $\begin{array}{r} 5\ 9\ 3\ r\ 3 \\ \hline \square\,)\,4747 \end{array}$
b $\begin{array}{r} 5\ 3\ 0\ r\ 4 \\ \hline \square\,)\,4774 \end{array}$
c $\begin{array}{r} 4\ 4\ 2\ r\ 6 \\ \hline \square\,)\,3542 \end{array}$
d $\begin{array}{r} 6\ 3\ 2\ r\ 3 \\ \hline \square\,)\,3795 \end{array}$
e $\begin{array}{r} 4\ 3\ 3\ r\ 1 \\ \hline \square\,)\,3032 \end{array}$

Cool Island Railway

Sicktown · 3024 m · Rap Lake · Jewel Heights · 442 m · Boogietown · 834 m · Geri Point · 648 m · 256 m · 1238 m · Savage Hollow · Cool City

Note: Map is not drawn to scale.

3 What is the average distance between railway stations for these trips?

a Sicktown to Jewel Heights via Cool City _____ m

b Sicktown to Boogietown via Geri Point and Savage Hollow _____ m

c Jewel Heights to Sicktown via Boogietown, Savage Hollow and Geri Point _____ m

d Cool City to Savage Hollow via Sicktown and Geri Point _____ m

e Sicktown to Sicktown in any direction _____ m

4 Find a 4-digit number that can be divided by 2, 4 and 8, then complete the divisions.

$2\,)\,\square\square\square\square$ $4\,)\,\square\square\square\square$ $8\,)\,\square\square\square\square$

Prime numbers are numbers that have only themselves and 1 as factors.
For example: 2, 3, 5 and 7 are prime numbers but 4, 8 and 9 are not.
Composite numbers are numbers with more than two factors.
For example: 24 has factors of 1, 2, 3, 4, 6, 8, 12 and 24.

5 Shade all the composite numbers on the hundred grid and circle all the prime numbers.

Hints

1 is not considered to be a prime number.

2 is the only even prime number.

Apart from 2 all even numbers are composites.

All multiples of 3 are composites, except 3 itself.

All multiples of 5 are composites, except 5 itself.

All multiples of 7 are composites, except 7 itself.
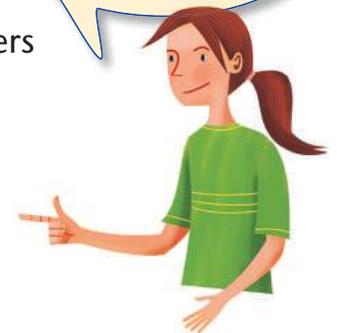
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Twin primes are prime numbers that are only 2 apart.
E.g. 17 and 19 are twin primes.

Prime numbers have only themselves and 1 as factors.

6 Answer Yes or No after you decide whether these pairs of numbers are twin primes or not.

a 31 and 33 _____   **e** 77 and 79 _____

b 41 and 43 _____   **f** 81 and 93 _____

c 59 and 61 _____   **g** 101 and 103 _____

d 71 and 73 _____   **h** 107 and 109 _____

7 In everyday language we say numbers differently to how we say them mathematically. Convert these everyday expressions of numbers into mathematical expressions.

Everyday expression	Mathematical expression
My mum earns $90k per year.	
That house sold for 1\frac{1}{2}$m.	
My sister was born in nineteen ninety-five.	
I won the fifteen-hundred-metre race.	
The price is twenty-one fifty.	

8 Jack said there were only two ways that a set of two coins could land.

a Do you agree with Jack? _____

b Sketch all the possible combinations of tossing two coins. Note that the coins are always read from left to right. Some outlines of pairs of coin sets have been provided for you. You may not need them all.

(H) (T)   ( ) ( )   ( ) ( )   ( ) ( )
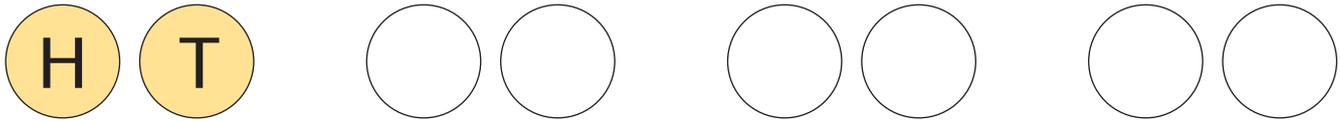
9 Sarah said there are six ways a set of 3 coins can land.

a Do you agree with Sarah? _____

b Sketch all possible combinations of tossing three coins. Note that coins are always read from left to right. Some sets of outlines of three coins have been provided below. You may not need them all.

(H) (T) (H)   ( ) ( ) ( )   ( ) ( ) ( )

( ) ( ) ( )   ( ) ( ) ( )   ( ) ( ) ( )

( ) ( ) ( )   ( ) ( ) ( )   ( ) ( ) ( )
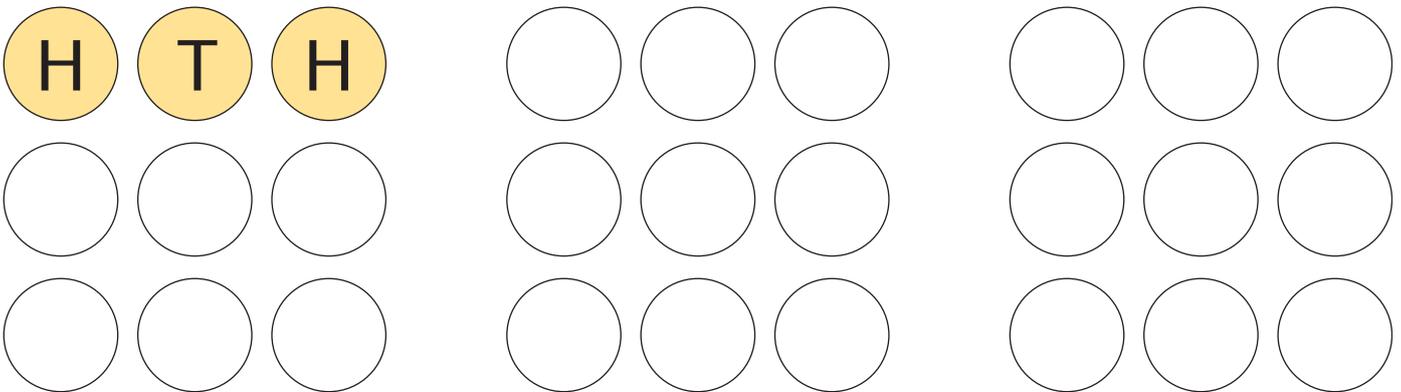
10 Madison said that heads will always come up more than tails if you toss a coin 100 times.

a Do you agree with Madison? _____

Joe did not agree with Madison and tossed a coin 100 times to see if she was correct. He sketched his result.

b Toss a coin 100 times to see if Madison is correct. Record your results in a tally.

(H)	
(T)	

c Do you think the 100-toss data sample is more accurate than a toss of 10? _____

d Why? _____

A side-by-side column graph allows us to display a range of data. The side-by-side columns show how the data can be divided into different groups.
E.g. The favourite colours of a sample group of children can be divided into boys and girls as well as colours as can be seen in this sample graph.

Favourite colours
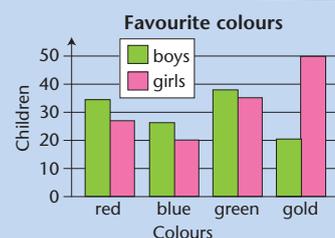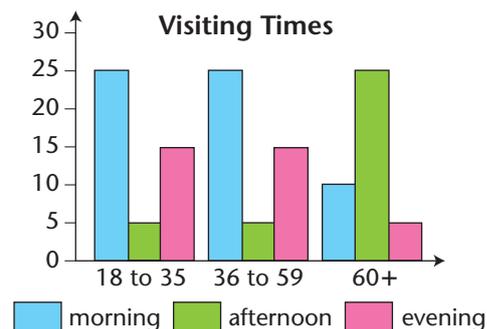
11 Jungle Gyms are opening a new mobile gymnasium. They surveyed the local community to decide the best time to visit the town.
The people in the survey were asked to:
- select their preferred time: morning, afternoon or evening
- identify their age group.
Refer to the graph to answer these questions.

Visiting Times

a Which time period was preferred by 18- to 35-year-olds? _____

b Which time period was preferred by 36- to 59-year-olds? _____

c Which time period was preferred by people over 60? _____

> **d** Suggest reasons why the morning was preferred by the 18- to 35-year-olds.
>
> _____
>
> _____

e Which time period was least preferred by the 18- to 35-year-olds? _____

f Which time period was least preferred by 36- to 59-year-olds? _____

g Which time period was least preferred by people over 60? _____

> **h** Suggest reasons why the afternoon was preferred by those over 60.
>
> _____
>
> _____

i Overall, how many people selected the morning as their preferred time? _____

j Overall, how many people selected the afternoon as their preferred time? _____

k Overall, how many people selected the evening as their preferred time? _____

> **l** Using the data, suggest a suitable time for Jungle Gym to visit the town.
>
> _____
>
> _____

PART 1

Give the numbers before and after these numbers.

a _____ 36 241 _____

b _____ 407 205 _____

c _____ 7642 _____

d _____ 2 628 700 _____

e _____ 74 533 909 _____

f Write the number: two million, eight hundred and seventy-two thousand, one hundred and one.

[_____]

PART 2

Round each number to the nearest 1000 to give an approximate answer.

a 49 565 + 34 329 ≈

b 72 428 − 59 625 ≈

c 86 379 + 13 708 ≈

d 99 299 − 54 854 ≈

e 70 801 + 19 499 ≈

Complete these additions and subtractions.

f
```
    4 8 3 5 7 4
  + 2 7 3 4 2 6
  ─────────────
```

g
```
    7 4 6 2 8 9
  + 2 1 2 5 7 7
  ─────────────
```

h
```
    9 5 6 7 5 7
  − 6 2 3 4 3 4
  ─────────────
```

i
```
    9 6 5 4 0 6
  − 2 8 4 6 8 3
  ─────────────
```

j 57 968 people attended the cricket test at the Sydney Cricket Ground and 168 915 attended the match at the Melbourne Cricket Ground. Estimate the total attendance to the nearest ten thousand. [_____]

k Merchandise sales at the Melbourne test were $591 202 compared to $147 808 in Sydney. What was the difference in sales? [_____]

l Shade the prime numbers below. The number one is not a prime number.

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

PART 3

Complete these multiplications.

a 40 × 5 =

b 400 × 5 =

c 70 × 3 =

d 700 × 3 =

e 12 × 4 =

f 12 × 8 =

g 16 × 4 =

h 16 × 8 =

i 61 × 6 ≈

j 49 × 8 ≈

k 299 × 4 ≈

l 305 × 7 ≈

m
```
    3 6 2
  ×     3
  ───────
```

n
```
    4 7 4 5
  ×       7
  ─────────
```

o
```
    3 5 3 7
  ×       8
  ─────────
```

p If Tim's average for 9 cricket games was 67, what was his total score? [_____] runs

q 4)5728   r 4)8544   s 8)9848

PART 4

Complete the equivalent fraction, decimal and percentage table.

	Fraction	Decimal	%
a	$\frac{27}{100}$		
b		0.99	
c			70%
d		0.06	

Add or subtract the fractions.

e $\frac{3}{8} + \frac{2}{8} =$

f $\frac{8}{12} − \frac{5}{12} =$

g $\frac{3}{10} + \frac{4}{10} =$

h $\frac{5}{10} + \frac{8}{10} =$

i $\frac{7}{10} − \frac{1}{10} =$

j $\frac{3}{5} + \frac{3}{5} =$

k $\frac{7}{10} − \frac{3}{10} =$

l $\frac{7}{8} + \frac{5}{8} =$

PART 5

Complete these decimal operations.

a
```
    5 8 . 5 3 km
  + 2 4 . 4 2
  ────────────
```

b
```
    6 7 . 7 5 m
  − 3 4 . 6 4
  ───────────
```

c
```
    8 7 . 2 6 kg
  − 6 3 . 0 8
  ────────────
```
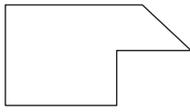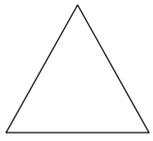
Diagnostic review 1
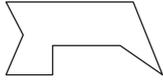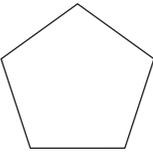
PART 6

a Draw a line to match each shape with its name.
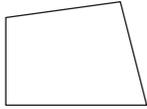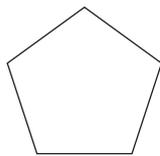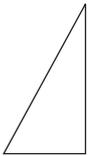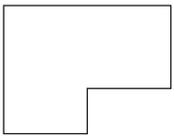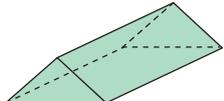
| Triangle |
| Hexagon |
| Pentagon |
| Quadrilateral |
| Octagon |

b Tick the shapes that have rotational symmetry.
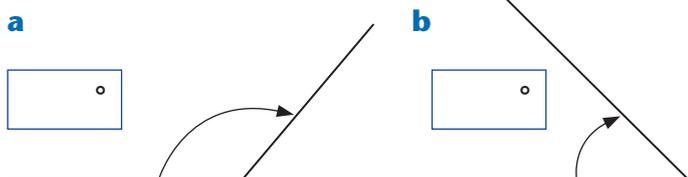
PART 7

Complete the table.
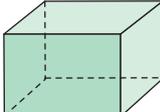
	Object	Faces	Vertices	Edges
a				
b				
c				

PART 8

Using the lines provided measure the angles.

a ___°

b ___°

PART 9

Measure the perimeter of the shape in millimetres.
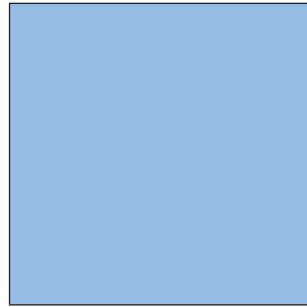
Perimeter

= _____ mm

PART 10

Calculate the areas in cm^2.

a Area = _____ cm^2
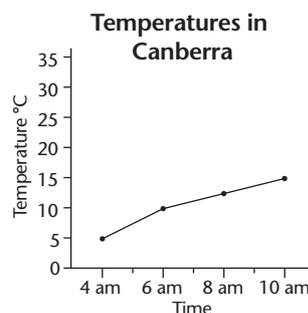
b Area = _____ cm^2

PART 11

Complete the timetable so that the time between each stop is 4 minutes.

a	Brent	23:28	23:45
b	Daly	23:32	23:
c	Levy		23:53
d	Gena		23:
e	Moss		00:
f	Hale		00:
g	Tilga		00:09
h	Roko	23:56	00:

PART 12

Temperatures in Canberra

Temperature °C — Time (4 am, 6 am, 8 am, 10 am)

Answer the questions.

a What was the temperature at 6 am? _____

b What was the temperature at 10 am? _____

c Approximately what was the temperature at 8 am? _____

Addition and subtraction strategies

The front-end strategy

47 495 − 24 563

Think 47 − 24 = 23,
so 47 thousand − 24 thousand = 23 thousand,
therefore 47 495 − 24 563 ≈ 23 000.

1 Use the front-end strategy to give approximate solutions to these additions and subtractions.

a
```
  4 8 3 6 5
− 1 5 9 5 4
```
≈ _____

b
```
  6 2 3 9 7
+ 2 9 4 5 8
```
≈ _____

c
```
  8 7 3 6 9
− 3 9 8 7 2
```
≈ _____

d
```
  9 5 3 6 7
+ 4 2 8 1 0
```
≈ _____

2 Estimate and then calculate the exact answer to these algorithms.

a
```
  5 8 3 2 7
− 2 6 7 8 5
```
≈ _____
= _____

b
```
  7 5 1 6 3
+ 2 8 6 2 1
```
≈ _____
= _____

c
```
  6 8 4 2 7
+ 7 2 2 1 0
```
≈ _____
= _____

d
```
  8 7 6 2 9
− 5 9 2 0 8
```
≈ _____
= _____

e
```
  3 7 9 2 5
+ 5 4 1 2 7
```
≈ _____
= _____

f
```
  8 6 9 0 1
− 3 9 2 1 8
```
≈ _____
= _____

g
```
  4 9 7 2 6
+ 7 5 2 1 9
```
≈ _____
= _____

h
```
  7 4 5 2 8
−   9 3 2 7
```
≈ _____
= _____

3 Tick the box to indicate whether an exact or approximate answer is needed to solve these problems. Explain your reasons.

a How much will it cost Mrs McPherson to buy a new car priced at $36 999 if she has been offered $13 450 as a trade-in on her old car?

Explanation: _____

_____

☐ exact	☐ approximate
Working	

b Tom has $10 000 in the bank and needs a car for his job. Can he afford a used car priced at $8950 if he also has to spend $1500 on tools?

Explanation: _____

_____

☐ exact	☐ approximate
Working	

40
Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers

Understanding, Reasoning
N CCT

Add and subtract fractions

4 Show how these fractions can be added or subtracted on the number lines supplied.

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

$0 \quad \frac{1}{10} \quad \frac{2}{10} \quad \frac{3}{10} \quad \frac{4}{10} \quad \frac{5}{10} \quad \frac{6}{10} \quad \frac{7}{10} \quad \frac{8}{10} \quad \frac{9}{10} \quad 1 \quad \frac{1}{10} \quad \frac{2}{10} \quad \frac{3}{10}$

b $\frac{11}{12} - \frac{5}{12} =$
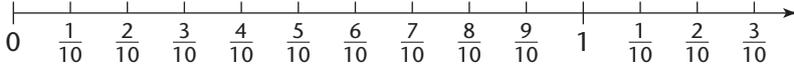
$0 \quad \frac{1}{12} \quad \frac{2}{12} \quad \frac{3}{12} \quad \frac{4}{12} \quad \frac{5}{12} \quad \frac{6}{12} \quad \frac{7}{12} \quad \frac{8}{12} \quad \frac{9}{12} \quad \frac{10}{12} \quad \frac{11}{12} \quad 1 \quad \frac{1}{12} \quad \frac{2}{12} \quad \frac{3}{12}$
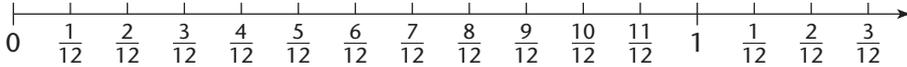
5 Add or subtract these common fractions. The first one is done for you.

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

b $\frac{3}{8} + \frac{4}{8} =$

c $\frac{1}{3} + \frac{1}{3} =$

d $\frac{3}{4} - \frac{1}{4} =$

e $\frac{8}{10} - \frac{5}{10} =$

f $\frac{7}{10} + \frac{1}{10} =$

g $\frac{8}{8} - \frac{3}{8} =$

h $\frac{5}{6} - \frac{3}{6} =$

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

j $\frac{8}{10} - \frac{3}{10} =$

k $\frac{1}{10} + \frac{2}{10} + \frac{4}{10} =$

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

m $\frac{1}{5} + \frac{1}{5} + \frac{1}{5} =$

n $\frac{1}{12} + \frac{3}{12} + \frac{6}{12} =$

o $\frac{3}{12} + \frac{4}{12} + \frac{1}{12} =$

> Common fractions have denominators which are the same.

Converting improper fractions to mixed numbers

When adding fractions we often obtain an answer that is greater than one.

In such cases the answer is first given as an improper fraction then converted to a mixed number by dividing its numerator by its denominator.

E.g. $\frac{7}{10} + \frac{7}{10} = \frac{14}{10} = 1\frac{4}{10}$

$0 \quad \frac{1}{8} \quad \frac{2}{8} \quad \frac{3}{8} \quad \frac{4}{8} \quad \frac{5}{8} \quad \frac{6}{8} \quad \frac{7}{8} \quad 1 \quad \frac{1}{8} \quad \frac{2}{8} \quad \frac{3}{8} \quad \frac{4}{8} \quad \frac{5}{8} \quad \frac{6}{8} \quad \frac{7}{8} \quad 2 \quad \frac{1}{8}$
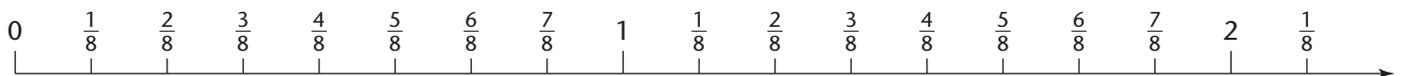
6 Add the fractions then convert the improper fraction answers to a mixed number. The number line may help you. The first one is done for you.

a $\frac{4}{8} + \frac{7}{8} = \frac{11}{8} = 1\frac{3}{8}$

b $\frac{6}{8} + \frac{6}{8} = \quad =$

c $\frac{7}{8} + \frac{5}{8} = \quad =$

d $\frac{7}{8} + \frac{4}{8} = \quad =$

e $\frac{6}{8} + \frac{5}{8} = \quad =$

f $\frac{5}{8} + \frac{5}{8} = \quad =$

7 Add the fractions to get an improper fraction then convert it to a mixed number. The first one is done for you.

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

b $\frac{3}{5} + \frac{4}{5} = \quad =$

c $\frac{4}{5} + \frac{4}{5} = \quad =$

d $\frac{2}{3} + \frac{2}{3} = \quad =$

e $\frac{5}{6} + \frac{4}{6} = \quad =$

f $\frac{7}{8} + \frac{7}{8} = \quad =$

g $\frac{7}{10} + \frac{7}{10} = \quad =$

h $\frac{9}{10} + \frac{6}{10} = \quad =$

i $\frac{6}{10} + \frac{7}{10} + \frac{4}{10} = \quad =$

j $\frac{9}{10} + \frac{9}{10} + \frac{7}{10} = \quad =$

k $\frac{3}{4} + \frac{3}{4} + \frac{3}{4} = \quad =$

l $\frac{3}{5} + \frac{3}{5} + \frac{3}{5} = \quad =$

Distance in kilometres		
Route	Road	Air
Sydney–Adelaide	1412	1165
Sydney–Canberra	286	237
Sydney–Melbourne	872	706
Canberra–Melbourne	648	470
Melbourne–Adelaide	731	650
Melbourne–Broken Hill	853	702
Adelaide–Alice Springs	1533	1320
Adelaide–Perth	2781	2118
Adelaide–Brisbane	2045	1616
Darwin–Alice Springs	1489	1307
Alice Springs–Uluru	443	333
Cairns–Brisbane	1716	1392
Brisbane–Sydney	1001	748
Brisbane–Melbourne	1674	1379
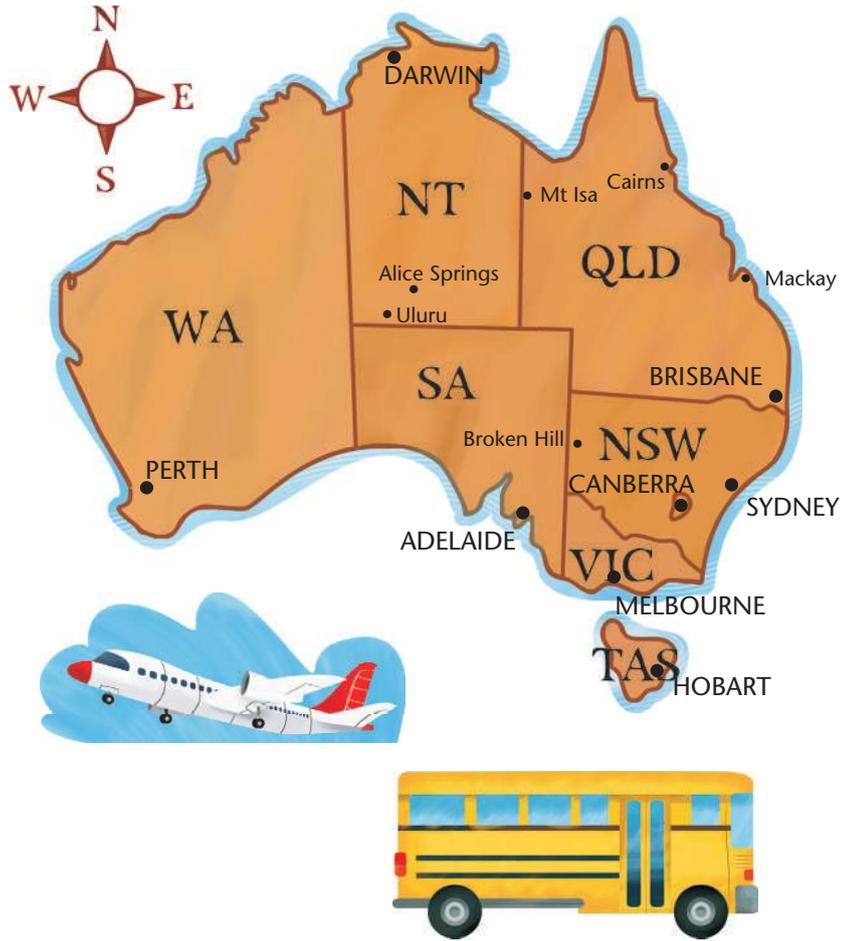
8 Calculate the difference between the distance by road and by air for each journey.

a	Darwin to Alice Springs		e	Brisbane to Cairns	
b	Sydney to Melbourne		f	Brisbane to Adelaide	
c	Sydney to Brisbane		g	Brisbane to Melbourne	
d	Sydney to Adelaide		h	Adelaide to Melbourne	
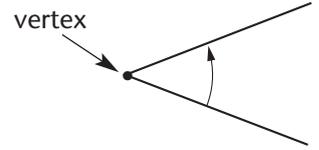
9 Solve the problems.

	Problem	Working
a	Lenny went on a bus tour around southern Australia. The bus travelled from Sydney to Canberra, from Canberra to Melbourne, from Melbourne to Adelaide and from Adelaide to Sydney. How many kilometres did he travel?	
b	Mrs Davis went on an adventure holiday. She flew from Melbourne to Sydney, from Sydney to Adelaide, from Adelaide to Brisbane and from Brisbane to Melbourne. How much did it cost her if her airfares averaged 60c per km?	
c	James caught a plane from Sydney to Melbourne, then a bus from Melbourne to Broken Hill and back. He then flew to Adelaide and then caught a bus back to Sydney. How many kilometres did James travel?	

10 Use a protractor to construct the following acute, obtuse and right angles with the vertex on the left.

vertex

acute angle 20°

obtuse angle 160°

acute angle 30°

obtuse angle 120°

right angle 90°

acute angle 25°

acute angle 60°

11 Use a protractor to construct the following angles with the vertex on the right. The first one has been done for you.

obtuse angle 170°

acute angle 20°

acute angle 80°

obtuse angle 110°

right angle 90°

obtuse angle 130°

Problem solving, Reasoning
N L

Investigate, with and without digital technologies, angles on a straight line, angles at a point and vertically opposite angles. Use results to find unknown angles

43

Adding and subtracting decimals

Decimal point alignment
Remember, always keep the decimal points in a vertical line.

1 Complete the additions to find the totals.

a litres	**b** metres	**c** kilograms	**d** tonnes	**e** litres
1 0 . 3 5 1	1 . 0 8	1 4 3 . 9 5	5 6 . 1 0	4 . 1 3 4
0 . 1 0 8	3 6 0 . 4 7	9 0 . 6 3	4 . 0 0 2	3 0 . 0 1 4
+ 1 7 . 8 7 4	+ 7 . 0 1	+ 1 9 1 . 3 8	+ 2 3 . 4 0	+ 2 8 . 1 0 4

f kilograms	**g** tonnes	**h** metres	**i** kilograms	**j** tonnes
6 1 . 4 6 1	1 2 . 3 0 8	8 5 . 6 2 3	4 1 5 . 2 1	1 5 4 . 2 3 4
3 . 1 7	6 7 . 8 1 2	1 . 4 6 5	2 4 5 . 6 6 7	6 . 5 1 8
+ 2 6 . 8 8 3	+ 2 5 . 3 4 1	+ 4 2 . 1 6 8	+ 3 1 6 . 5 0 8	+ 6 3 2 . 1 9 4

2 Complete these subtractions and then use addition to check your answers.

a litres	**b** tonnes	**c** metres	**d** kilograms	**e** tonnes
1 8 . 4 5 9	6 8 . 5 9 9	1 7 . 3 5 6	2 1 . 3 8	4 8 . 3 8 2
− 3 . 2 4 7	− 4 . 2 5 8	− 2 . 9	− 6 . 7 5 4	− 2 4 . 5 7

1 5 . 2 1 2				
+ 3 . 2 4 7	+ 4 . 2 5 8	+ 2 . 9	+ 6 . 7 5 4	+ 2 4 . 5 7

3 Solve and check your solutions to these problems.

a	What is the difference between Ben's mass of 32.475 kilograms and Lisa's mass of 28.683 kg?		**d**	How much longer is the tail on Tina's kite if it is 1.757 m compared to Jeni's whose is 0.086 m?	
b	How far did Ken and Anna drive if Ken drove 18.56 km and Anna drove 237.8 km?		**e**	How much more can be added to the load of 1.568 tonnes before it reaches 2 tonnes?	
c	How far do we still have to go if the trip is 186 km and we have driven 45.5 km so far?		**f**	What is the balance of Ben's bank account if he had $265.75 and deposited another $38.60?	

Add and subtract decimals, with and without digital technologies, and use estimation and rounding to check the reasonableness of answers

Problem solving, Understanding
N CCT

Unit fractions of a quantity

To find a fraction of a group, divide the group by the denominator.

$\frac{1}{5}$ of 75 $\longrightarrow$ 75 ÷ 5 = 15. So $\frac{1}{5}$ of 75 is 15.

4 Use the array to find the fractions of 24.

a $\frac{1}{4}$ of 24 =   d $\frac{1}{8}$ of 24 =

b $\frac{1}{6}$ of 24 =   e $\frac{1}{3}$ of 24 =

c $\frac{1}{2}$ of 24 =   f $\frac{1}{12}$ of 24 =

I scored $\frac{1}{4}$ of our team's 48 points. 48 ÷ 4 = 12

5 Find the fraction of each group.

a $\frac{1}{3}$ of 60 = _____   d $\frac{1}{3}$ of 360 = _____   g $\frac{1}{6}$ of 4200 = _____

b $\frac{1}{3}$ of 90 = _____   e $\frac{1}{3}$ of 180 = _____   h $\frac{1}{6}$ of 1200 = _____
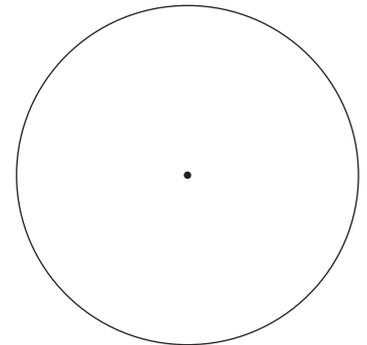
c $\frac{1}{3}$ of 150 = _____   f $\frac{1}{3}$ of 480 = _____   i $\frac{1}{12}$ of 1200 = _____

6 The 360 visitors to the zoo on Sunday were asked to name their favourite exhibit. Calculate how many votes each exhibit received, and then create a pie chart to represent each exhibit.

Pie chart — favourite exhibits

Show how people voted if:

a $\frac{1}{2}$ voted for the Underwater exhibit. _____

b $\frac{1}{4}$ voted for the Baby Animals exhibit. _____

c $\frac{1}{6}$ voted for the Monkeys exhibit. _____

d $\frac{1}{12}$ voted for the Reptile exhibit. _____

7 Solve the problems.

a Jack had a bag of 3200 marbles but lost $\frac{1}{8}$ of them through a hole in the bag. How many did he lose?

b Tina had 2400 stamps but gave $\frac{1}{6}$ of them away. How many did she give away?

c Soula had 4200 swap cards. If she gave $\frac{1}{4}$ to Alana how many would she have left?

d Tom had 100 toy soldiers but gave $\frac{1}{4}$ of them away and sold $\frac{1}{10}$ of them. How many did he have left?

8 Write as many unit fractions as you can with an answer of 60.

$\frac{1}{2}$ of 120 = 60

9 Use the graph which shows the amount of petrol in Jo's car, to answer the True or False problems.

Petrol in Jo's car
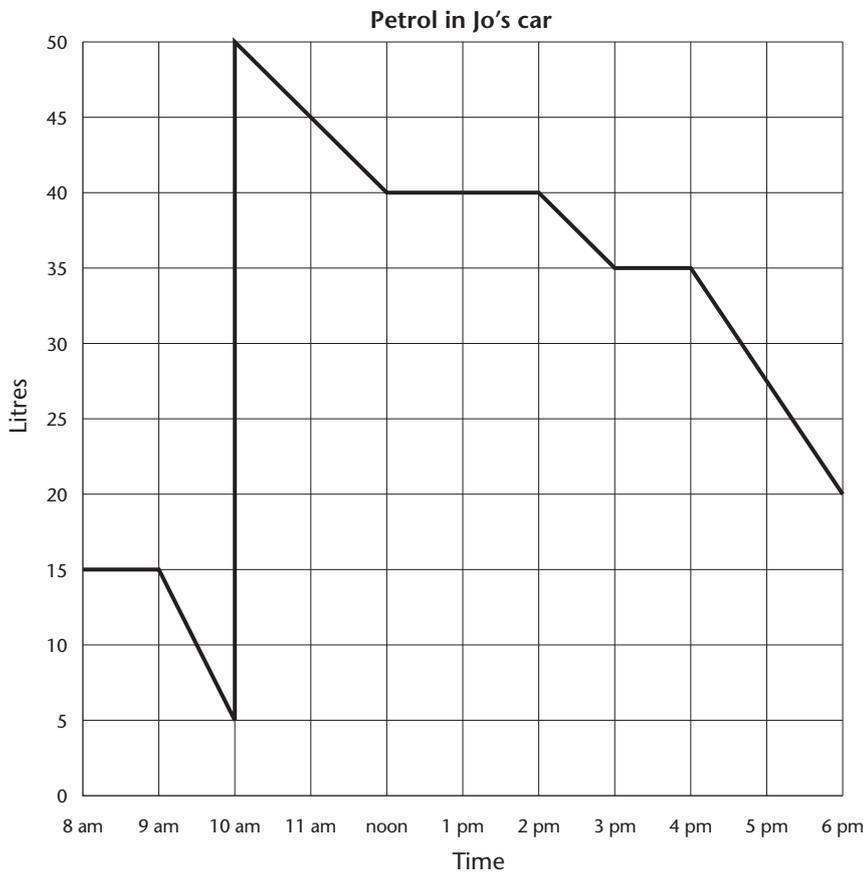
		T or F
a	The petrol tank held 15 litres of petrol at 8 am.	
b	Jo started driving at 9 am.	
c	She used 10 litres of petrol between 9 and 10 am.	
d	At 10 am she bought 45 litres of petrol.	
e	From 10 am until noon she used 15 litres of petrol.	
f	The car was parked from noon until 2 pm.	
g	At 3:30 pm there were 35 litres in the tank.	
h	Jo used 40 litres of petrol throughout the day.	

10 **Ashley's mass from age 2–12**

Age	2	3	4	5	6	7	8	9	10	11	12
Mass	12 kg	14 kg	16 kg	18 kg	20 kg	22 kg	25 kg	29 kg	33 kg	37 kg	44 kg

Ashley's mass from 2 years to 12 years
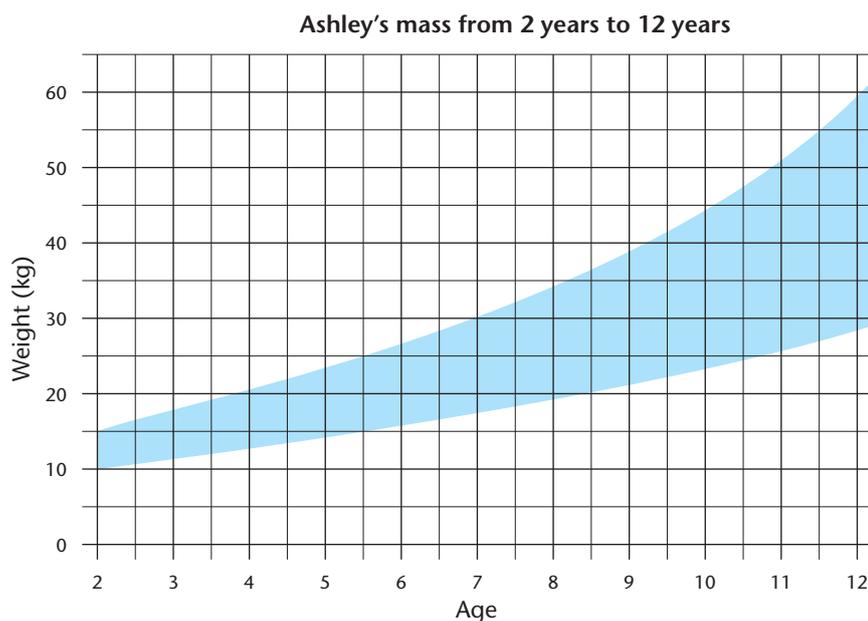
Ashley's mum has always recorded Ashley's weight on her birthday. Plot the points on the graph below and draw a line to connect the points. The shaded area represents the range of weights of the majority of Australian girls.

When I was 8 I weighed exactly 25 kg.

46 Interpret and compare a range of data displays, including side-by-side column graphs for two categorical variables

Problem solving
N L CCT

1000 kilograms = **1 tonne (t)**.
A small car would have a mass of about 1 tonne.

Below are the dimensions of some popular vehicles. Use the information to compare them.

Vehicle	Length	Width	Height	Mass
Toyota Landcruiser	4890 mm	1940 mm	1915 mm	2413 kg
Nissan Patrol	4930 mm	1930 mm	1855 mm	2371 kg
Holden Commodore	4891 mm	1842 mm	1450 mm	1526 kg
Toyota Echo	4145 mm	1660 mm	1510 mm	890 kg
Toyota Corolla	4385 mm	1695 mm	1475 mm	1146 kg

11 Place the vehicles listed on the chart in order of mass from lightest to heaviest and convert the mass from kilograms to tonnes using decimal notation.

Vehicle	Echo				
Mass	0.890 t	t	t	t	t

12 Calculate the differences in mass in kilograms between these vehicles.

a
Landcruiser Patrol	
Difference	

b
Landcruiser Commodore	
Difference	

c
Commodore Corolla	
Difference	

d
Corolla Echo	
Difference	

13 Mr Purcell has a delivery van but it has a 2-tonne limit on its load capacity.

How many of each item would he be able to pack into his van?

a 200 kg   **b** STURDY SAFE 500 kg   **c** 50 kg   **d** Dumbbells 400 kg   **e** GLASSES 10 kg

14 Convert these measurements to a different unit of mass.

a 5 t = _____ kg

b 3.5 t = _____ kg

c 10 t = _____ kg

d 5.5 kg = _____ g

e 7.3 kg = _____ g

f 2.5 kg = _____ g

g 4.999 t = _____ kg

h 6.123 t = _____ kg

i 9.505 t = _____ kg

Order of operations

Rules for order of operations
- Always do the work in the brackets first. $(3 + 6) \times 7 = 63$
- Do multiplication and division before addition and subtraction. $6 + 8 \times 3 = 30$
- Do operations with division and multiplication from left to right. $3 \times 8 \div 2 = 12$
- Do operations with addition and subtraction from left to right. $5 + 8 - 6 = 7$

1 Do the brackets first.

a $(9 - 4) \times 5 =$ ☐

c $(6 + 8) \times 5 =$ ☐

e $(5 + 7) \times 4 - 10 =$ ☐

b $7 \times (5 + 6) =$ ☐

d $3 \times (20 - 5) - 9 =$ ☐

f $70 - (3 + 8) \times 4 =$ ☐

2 Work from left to right.

a $8 + 7 + 25 - 20 =$ ☐

d $60 - 35 + 27 - 23 =$ ☐

g $118 + 17 - 15 + 5 =$ ☐

b $25 + 60 + 23 - 30 =$ ☐

e $70 - 29 + 9 - 22 =$ ☐

h $127 + 13 - 15 + 9 =$ ☐

c $7 \times 4 \div 2 =$ ☐

f $6 \times 8 \div 4 \times 3 =$ ☐

i $7 \times 8 \div 4 \times 9 =$ ☐

3 Put brackets around the part to be calculated first, then solve each one.

a $13 + 7 \times 5 =$ ☐

d $6 \times 8 \div 6 + 29 =$ ☐

g $7 + 8 \times 5 + 37 =$ ☐

b $72 + 88 \div 4 =$ ☐

e $42 + 99 \div 3 + 53 =$ ☐

h $30 + 85 \div 5 + 27 =$ ☐

c $40 - 5 \times 7 =$ ☐

f $160 + 40 \div 5 - 27 =$ ☐

i $300 - 81 \div 3 + 7 =$ ☐

4 Use the rules for 'order of operations' to solve these.

a $2 \times (33 + 3) + 27 =$ ☐

d $(35 + 7) \times 5 - 35 =$ ☐

g $100 - 4 \times (30 - 16) =$ ☐

b $37 + 6 \times (12 + 3) =$ ☐

e $88 + (7 + 9) \div 4 =$ ☐

h $(100 - 37) \times 4 + 7 =$ ☐

c $35 + 7 \times 5 - 35 =$ ☐

f $3 \times 66 \div 3 + 29 =$ ☐

i $110 - 7 + 6 \times (9 + 5) =$ ☐

5 Complete these fraction and decimal number sentences.

a $4.2 \times 4 + 3 =$ _____

d $\frac{1}{2} \times 30 + 15 =$ _____

g $\frac{1}{5} \times (12 + 8) + 25 =$ _____

b $4.5 + 2 \times 7 =$ _____

e $\frac{1}{3} \times 3 \times 6 =$ _____

h $\frac{1}{8} \times 32 + \frac{1}{4} \times 20 =$ _____

c $6.5 \times 8 - 20 + 4 =$ _____

f $12 + \frac{1}{4} - 5 =$ _____

i $0.5 \times (6 + 12) - 9 =$ _____

6 $360 \div (10 + 2) =$ _____. Is the solution 30 or 38? Explain your reason.

Reasoning, Fluency
N CCT

7 Convert these key percentages into decimal fractions and common fractions. Some have been done for you.

Percentage	1%	10%	20%	25%	50%	100%
Decimal	0.01					1.00
Common fraction				$\frac{1}{4}$		

1% is equal to 1 out of 100.

Converting percentages into common fractions

Example: Only 10% of the class of 30 returned their sports notes. How many was that?

Think 10% is 1 tenth; $\frac{1}{10}$ of 30 is 3. This means that only 3 people returned their notes.

8 Follow the strategy of converting percentages into common fractions to solve the problems.
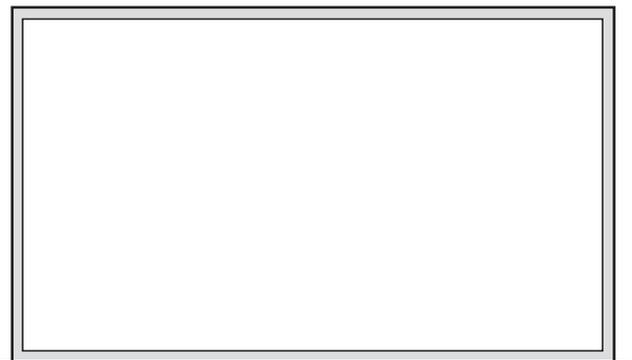
a	How much was the deposit to hire a tennis court if it was 20% of the total price of $40?		
b	How many of 80 questions did Dana answer correctly if she answered 50% correctly?		
c	On mufti day 25% of 24 students wore football jumpers to school. How many kids were wearing footy jumpers?		
d	How many students ride a bike to school if 1% of the 400 students ride to school?		
e	How many people voted for the Environmental Party at the last election if 10% of the 450 people voted for them?		VOTE 1 Yes to the Environmental Party

9 Find the quantities of animals.

a 10% of 50 sheep _____   **e** 25% of 200 mice _____

b 10% of 40 lambs _____   **f** 25% of 180 chickens _____

c 10% of 80 cattle _____   **g** 20% of 80 ducks _____

d 25% of 100 geese _____   **h** 20% of 120 sheep _____

10 On the right is a whiteboard.

a Mrs Rolf has a diagram on 50% of the board. Shade that part green.

b She has text relating to the diagram on 25% of the board. Shade that part yellow.

c She has a spelling list on 10% of the board. Shade that part red.

d How much of the board was left white? _____

A **parallelogram** is a four-sided shape where each pair of opposite sides are parallel and equal in length.
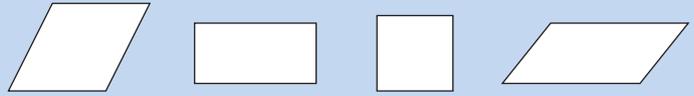
11 Draw and name the parallelogram that matches each description.

a
- four right angles
- four sides of equal length
- diagonals are equal in length
- four axes of symmetry

b
- opposite pairs of angles are equal
- four sides of equal length
- diagonals are unequal in length
- two axes of symmetry

c
- four right angles
- opposite sides are of equal length
- diagonals are equal in length
- two axes of symmetry

d
- opposite pairs of angles are equal
- opposite sides are of equal length
- diagonals are unequal in length
- no axes of symmetry

12 Using the dot paper, prove how parallelograms other than squares and rectangles tessellate. Create your own:

a tessellating pattern using the rhombus.

b tessellating pattern using a parallelogram, like the one you drew in 11d.

Investigate, with and without digital technologies, angles on a straight line, angles at a point and vertically opposite angles. Use results to find unknown angles

Problem solving, Reasoning
CCT L
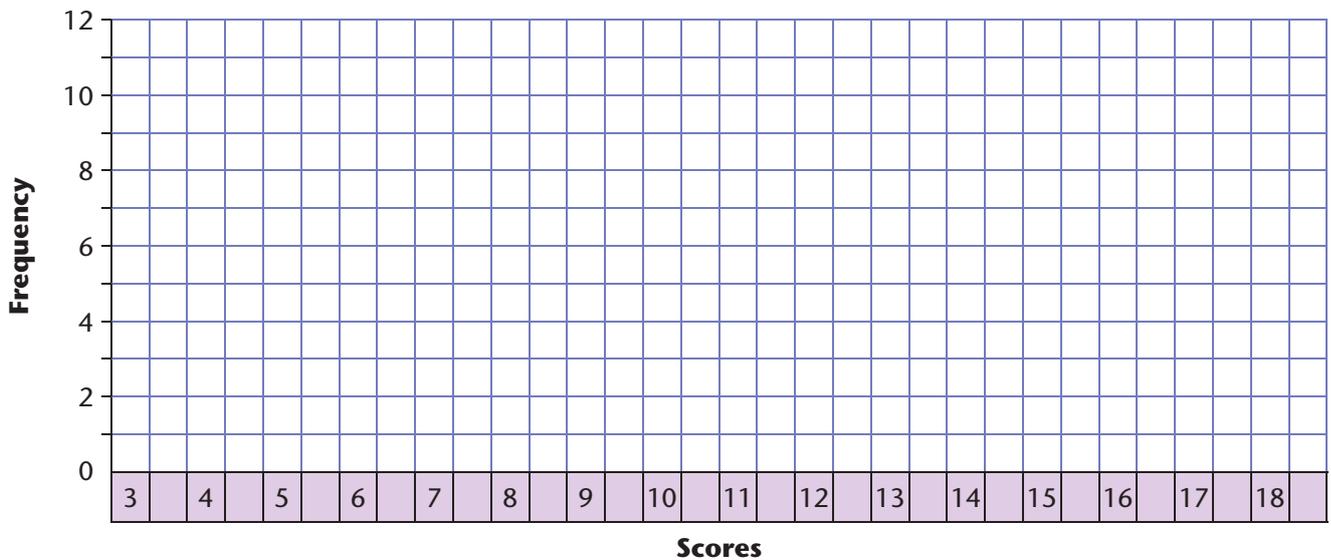
13 Testing conjectures

a Tom said that the most frequently occurring total when you roll 3 dice is 6, do you agree? _____

b Predict the most likely score from rolling 3 dice. _____

c Roll 3 dice 60 times. Use tally marks to record the number of times each score occurs then transfer this information onto a column graph.

3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
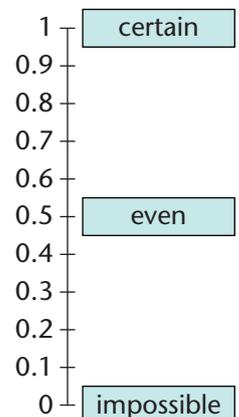
Frequency vs **Scores** column graph (3 to 18)

d What was the most frequently occurring score? _____

e Explain why it would be more likely to throw a score of 11 than a score of 3.

_____

_____

_____

14 Answer true or false to these events happening when 3 dice are thrown.

a The chance of rolling total scores of 3 or 18 is the same. _____

b The chance of rolling a total score that is an even number is about 0.5. _____

c The chance of rolling a 2 is about 0.2. _____

d The chance of rolling a total score greater than 18 is zero. _____

e It is more likely that you would roll a total of 10 than 17. _____

f 4 and 12 would have about the same chance of being rolled. _____

1 — certain
0.9
0.8
0.7
0.6
0.5 — even
0.4
0.3
0.2
0.1
0 — impossible

Operations with decimals

Decimal point alignment
Remember, always keep the decimal points in a vertical line.

1 Complete these operations.

a
```
  8 . 6 7
− 1 . 2 1
─────────
  □ . □ □
```

b
```
  5 . 3 4 7
− 3 . 1 6 6
───────────
  □ . □ □ □
```

c
```
  4 . 3 7 2
− 2 . 7 6 1
───────────
  □ . □ □ □
```

d
```
  5 8 . 4 4 5
− 3 9 . 8 2
─────────────
  □ □ . □ □ □
```

e
```
  8 6 . 6 6
− 4 5 . 1 5 7
─────────────
  □ □ . □ □ □
```

f
```
  4 3 . 6 2 7
     2 . 6 4
+    3 . 7 2 4
──────────────
  □ □ . □ □ □
```

g
```
     7 . 3 4 3
     8 . 6 3 5
+    3 . 3 3
──────────────
  □ □ . □ □ □
```

h
```
  $ 4 7 6 . 9 2
      3 5 4 . 7 4
+         4 . 0 8
─────────────────
    □ □ □ . □ □
```

i
```
  $ 5 4 8 . 5 4
          8 . 0 6
+ 6 2 8 . 6 5
─────────────────
    □ □ □ . □ □
```

j
```
  $ 2 6 7 . 4 7
       5 0 . 7 2
+ 3 4 2 . 0 7
─────────────────
    □ □ □ . □ □
```

2 Solve the problems. (You will need some working paper.)

$9.55 $55.35 $23.70 $82.45 $69.90

a Find the cost of a CD and an MP3 player. $ _____

b Find the cost of a video game, a skateboard and a baseball cap. $ _____

c How much would 2 MP3 players and a CD cost? $ _____

d How much would 3 CDs and a skateboard cost? $ _____

e If Joseph had saved $151, would he have enough to buy a skateboard
   and a video game? $ _____

f How much would 3 baseball caps and 2 CDs cost? $ _____

g How much would a CD, an MP3 player and a video game cost? $ _____

h How much would one of each item cost altogether? $ _____

3 Backtrack to see if Emma got the correct change.
Emma paid $69.90 for a dress with a $100 note
and received $30.10 change.

Add and subtract decimals, with and without digital technologies,
and use estimation and rounding to check the reasonableness of answers

Problem solving, Understanding
N CCT

4 Expand the numbers. The first one is done for you.

a 227 386   200 000 + 20 000 + 7000 + 300 + 80 + 6

b 576 491   ☐ + ☐ + ☐ + ☐ + ☐ + ☐

c 963 237   ☐ + ☐ + ☐ + ☐ + ☐ + ☐

d 425 310   ☐ + ☐ + ☐ + ☐ + ☐

e 240 300   ☐ + ☐ + ☐

f 780 407   ☐ + ☐ + ☐ + ☐

g 6 029 256   ☐ + ☐ + ☐ + ☐ + ☐ + ☐

5 Write the numbers in words.

a 356 257 _____

b 479 807 _____

c 906 007 _____

d 4 274 300 _____

e 27 360 027 _____

6 **Phone numbers**

a Write down 7 home phone numbers of your classmates in Grid A.

b Order the phone numbers from smallest to largest in Grid B.

Grid A	Grid B

7 **Write the number**

a I am a number that has a 6 in the tens of thousands place, a 7 in the hundreds of thousands and a 4 in the thousands. My last 3 digits are 319.
What am I? ☐

b I am a number that has a 7 in the millions place, a 4 in the thousands place, a 6 in the tens, a 3 in the tens of thousands and a 9 in the ones. The other places have zeros.
What am I? ☐

Understanding, Problem solving
N CCT

Investigate everyday situations that use integers.
Locate and represent these numbers on a number line

53

Potentially misleading data

The following data may be misleading when you look at the source of the data (where it is collected).

8 Write whether you think the statements in bold are credible or not. Give your reasons for this.

a *Rocket Sports Drink is now Australia's favourite drink!*
(95% of people surveyed at the Rocket Sports Drink launch said that Rocket Sports Drink was their favourite drink.)

_____

_____

b *90 per cent of our children read every night!*
(90 out of 100 children said they read every night when interviewed at a children's book shop.)

_____

_____

c *There are more women than men in Australia!*
(The recent Australian Government census found that women outnumber men slightly in Australia.)

_____

_____

9 Study both graphs about the Australasian Mining Company (AMC).

Weekly Prices (July first week)
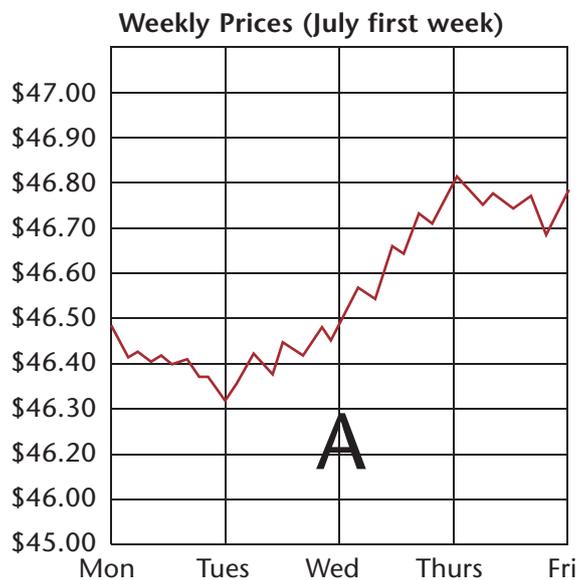
Huge rise in the price of AMC shares!

Half Yearly Prices
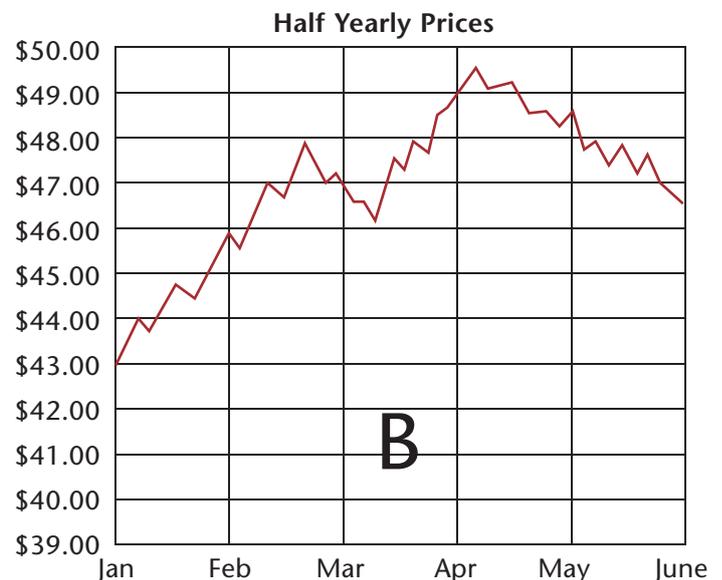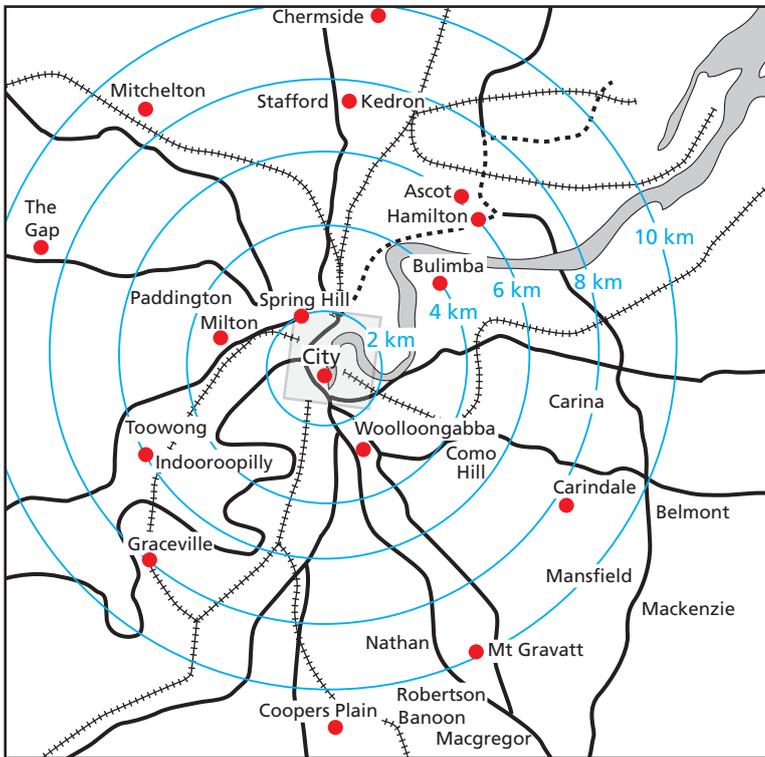
Market Unsure on AMC shares!

a Which graph and statement could be viewed as misleading? _____

b Explain why. _____

_____

_____
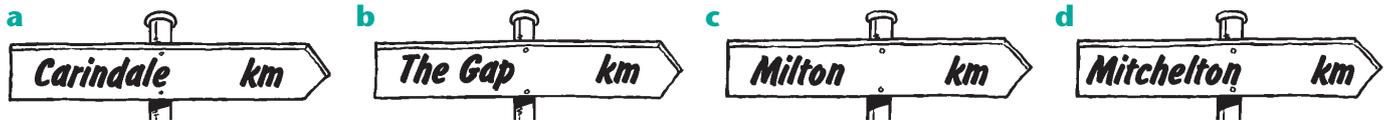
Longer distances are measured in **kilometres**. There are 1000 m in 1 kilometre.

10 Estimate how far the following destinations are from the city centre in kilometres.

a Ascot _____ km

b Indooroopilly _____ km

c Bulimba _____ km

d Chermside _____ km

e Spring Hill _____ km

f Kedron _____ km

g Coopers Plain _____ km

h Hamilton _____ km

i Mt Gravatt _____ km

j Woolloongabba _____ km

k Graceville _____ km

11 Estimate the distance of the suburb from the CBD. Write your answers on the signposts.

a *Carindale*   km

b *The Gap*   km

c *Milton*   km

d *Mitchelton*   km

12 Record these distances in kilometres using decimal notation.

a 9154 metres = 9.154 km

b 6729 metres = _____

c 7935 metres = _____

d 5629 metres = _____

e 10 956 metres = _____

f 15 638 metres = _____

g 19 006 metres = _____

h 14 100 metres = _____

13 Convert the length units.

a 3 km = _____ m

b $3\frac{1}{2}$ m = _____ cm

c 5000 m = _____ km

d 1500 m = _____ km

e 3.25 m = _____ cm

f 2.75 m = _____ cm

14

Sheree keeps a log book of all her work trips. On the left is the odometer reading at the start of her trip. Show the odometer reading at the end of the day if she made three trips:

Trip 1   14.250 km

Trip 2   36.350 km

Trip 3   24.400 km

Odometer: ☐ ☐ ☐ ☐ ☐ ☐

1 Complete the multiplications.

a
```
  7 5 6 3
×       5
_____
```

b
```
  2 3 5 4
×       4
_____
```

c
```
  5 6 7 9
×       6
_____
```

d
```
  2 5 0 6
×       4
_____
```

e
```
  3 5 8 0
×       5
_____
```

f
```
  6 3 2 1
×       2
_____
```

g
```
  7 5 6 0
×       5
_____
```

h
```
  3 5 7 9
×       7
_____
```

i
```
  6 4 0 8
×       8
_____
```

j
```
  2 0 9 7
×       6
_____
```

k
```
  3 5 2 6
×       9
_____
```

l
```
  6 0 0 9
×       8
_____
```

m
```
  7 0 5 0
×       7
_____
```

n
```
  3 0 6 0
×       9
_____
```

o
```
  8 0 0 7
×       9
_____
```

2 Find the missing numbers in each multiplication.

a
```
  2 3 5 □
×       6
_____
1 4 1 3 0
```

b
```
  3 6 2 4
×       □
_____
1 8 1 2 0
```

c
```
  7 5 0 9
×       □
_____
6 0 0 7 2
```

d
```
  6 □ 2 □
×       7
_____
4 5 6 6 1
```

e
```
  □ 2 □ 4
×       6
_____
4 3 5 8 4
```

The BMP office tower
- There are 8 floors.
- 1354 tiles were used on each floor.
- Each floor has 298 light fittings.
- Each floor has a carpeted area of 284 m².
- Average rent for each floor is $1769.
- The cost of carpet is $100 m².

3 Use the information above to solve the problems.

a How many light fittings would there be in the whole building?

b How many square metres of carpet are there in the whole building?

c How many tiles are used on the floors 3, 4, 5 and 6?

d What would be the rent for the whole building?

4 Write a problem to suit the multiplication then solve it.

```
  3 5 7 4
×       4
_____
```

Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers

Problem solving, Reasoning
CCT N

Equivalent fractions

Equivalent fractions are fractions that have the same value. E.g. $\frac{1}{2} = \frac{2}{4}$

Fraction wall

1 Whole							Whole
$\frac{1}{2}$			$\frac{2}{2}$				Halves
$\frac{1}{4}$	$\frac{2}{4}$		$\frac{3}{4}$		$\frac{4}{4}$		Quarters
$\frac{1}{8}$ $\frac{2}{8}$	$\frac{3}{8}$ $\frac{4}{8}$	$\frac{5}{8}$ $\frac{6}{8}$	$\frac{7}{8}$ $\frac{8}{8}$				Eighths
$\frac{1}{3}$	$\frac{2}{3}$		$\frac{3}{3}$				Thirds
$\frac{1}{6}$ $\frac{2}{6}$	$\frac{3}{6}$ $\frac{4}{6}$	$\frac{5}{6}$ $\frac{6}{6}$					Sixths
$\frac{1}{12}$ $\frac{2}{12}$ $\frac{3}{12}$ $\frac{4}{12}$	$\frac{5}{12}$ $\frac{6}{12}$ $\frac{7}{12}$ $\frac{8}{12}$	$\frac{9}{12}$ $\frac{10}{12}$ $\frac{11}{12}$ $\frac{12}{12}$					Twelfths

5 Answer true or false to compare the fractions.

a $\frac{1}{2} > \frac{1}{6}$ ____

b $\frac{1}{2} < \frac{1}{4}$ ____

c $\frac{1}{3} > \frac{1}{6}$ ____

d $\frac{1}{2} < \frac{3}{8}$ ____

e $\frac{1}{4} = \frac{3}{8}$ ____

f $\frac{1}{3} > \frac{3}{6}$ ____

g $\frac{2}{3} < \frac{1}{6}$ ____

h $\frac{1}{3} > \frac{5}{12}$ ____

i $\frac{2}{3} < \frac{1}{12}$ ____

j $\frac{1}{4} = \frac{3}{12}$ ____

k $\frac{2}{6} > \frac{5}{12}$ ____

l $\frac{1}{4} < \frac{5}{8}$ ____

> greater than
< less than

6 Complete the equivalent fractions.

a $\frac{1}{2} = \frac{\Box}{4}$

b $\frac{1}{4} = \frac{\Box}{8}$

c $\frac{1}{3} = \frac{\Box}{6}$

d $\frac{1}{3} = \frac{\Box}{12}$

e $\frac{1}{4} = \frac{\Box}{12}$

f $\frac{3}{4} = \frac{\Box}{12}$

g $\frac{1}{2} = \frac{\Box}{12}$

h $\frac{3}{4} = \frac{\Box}{8}$

i $\frac{2}{3} = \frac{\Box}{12}$

j $\frac{2}{8} = \frac{\Box}{12}$

k $\frac{2}{3} = \frac{\Box}{6}$

l $\frac{8}{12} = \frac{\Box}{6}$

7 Write some equivalent fractions, decimals or percentages for these common fractions.

a	$\frac{1}{4}$	
b	$\frac{3}{10}$	
c	$\frac{1}{3}$	
d	$\frac{1}{5}$	

8 Study the rules for divisibility to aid you in identifying factors.

÷	2	The last digit is an even number.
÷	3	The sum of the digits add to be a multiple of 3, for example 63 = 6 + 3 = 9
÷	4	The last 2 digits are multiples of 4, for example 9<u>12</u>
÷	5	The last digit is a 5 or a 0
÷	6	No rule
÷	7	No rule
÷	8	The last 3 digits are multiples of 8, for example 5<u>160</u>
÷	9	The sum of the digits is a multiple of 9, for example 54 = 5 + 4 = 9
÷	10	The last digit is a 0

Prime numbers are numbers that only have themselves and 1 as factors. **Composite** numbers are numbers with more than 2 factors.

9 Use these rules to identify the prime and composite numbers below.

a 54 ___composite___

b 80 _____

c 64 _____

d 81 _____

e 71 _____

f 83 _____

g 99 _____

h 77 _____

i 93 _____

j 97 _____

k 86 _____

l 66 _____

m 76 _____

n 98 _____

o 63 _____

p 65 _____

q 67 _____

r 69 _____

s 73 _____

t 75 _____

u 79 _____

10 Shade the numbers in the grid that are divisible by the given divisor.

	Divisor	Number				
a	2	14	100	248	152	2157
b	3	18	396	67	225	1233
c	4	28	112	1442	1347	3856
d	5	50	275	171	2275	4723
e	8	68	248	1480	2344	1560
f	9	83	135	3348	3448	2557
g	10	997	990	1040	3395	10 000

297 is divisible by 9 because 2 + 9 + 7 = 18 which is a multiple of 9.

11 Create 4 numbers of at least 3 digits that are divisible by 4. _____

12 Create 4 numbers of at least 3 digits that are divisible by 8. _____

13 Create 4 numbers of at least 3 digits that are divisible by 9. _____

14 Reflect each shape.

a
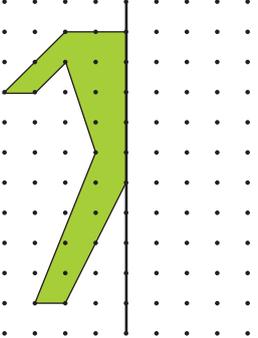
b
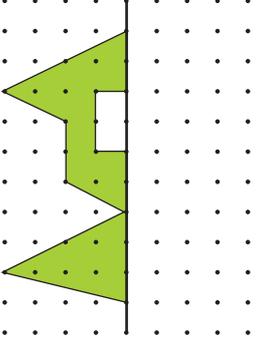
c
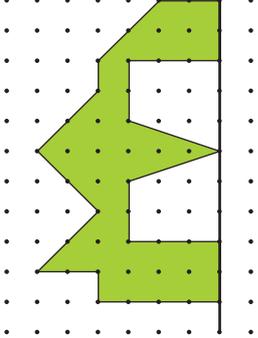
Translate = slide
Rotate = turn
Reflect = flip

15 Translate each shape as directed.
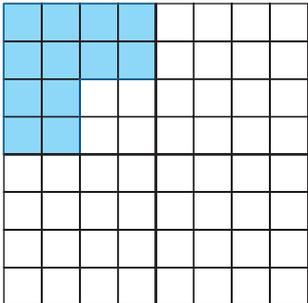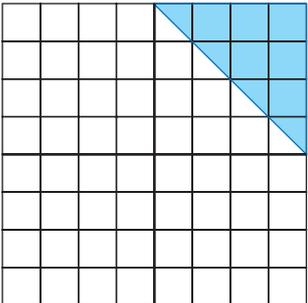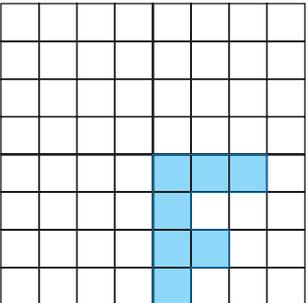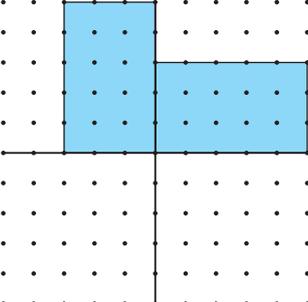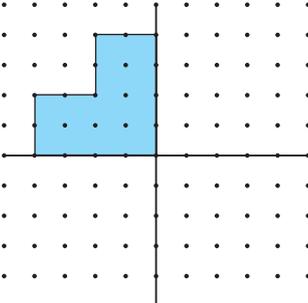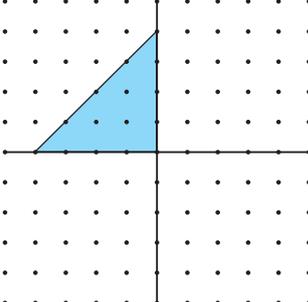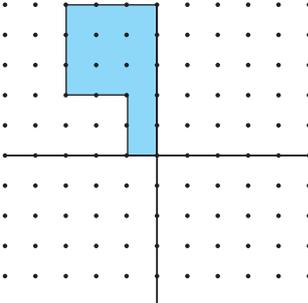
a To the right   b To the left   c Directly above   d Directly below
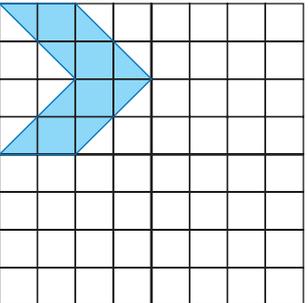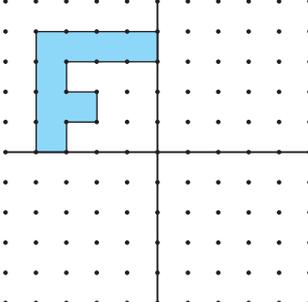
16 Rotate each shape clockwise around 360°. The first one has been started for you.

a

c

e

b

d
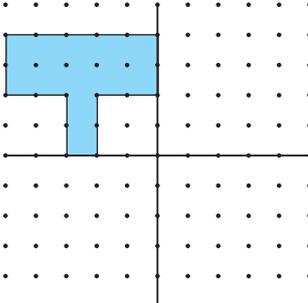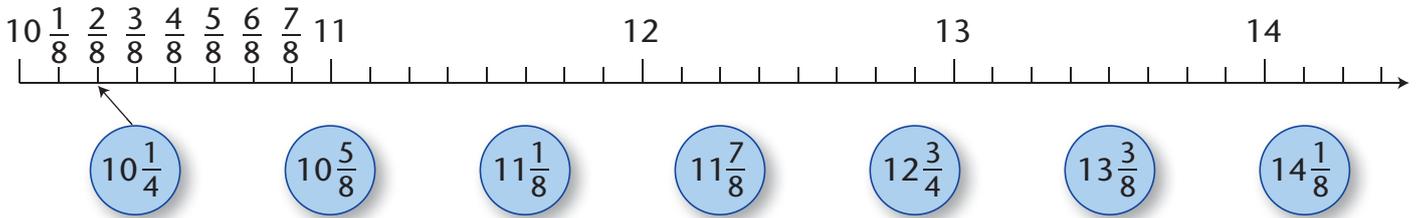
f
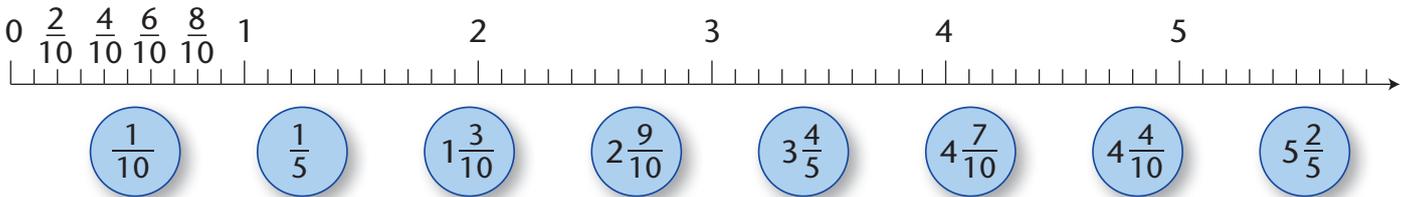
17 Explain the movements needed to construct this pattern.
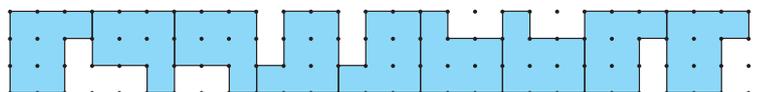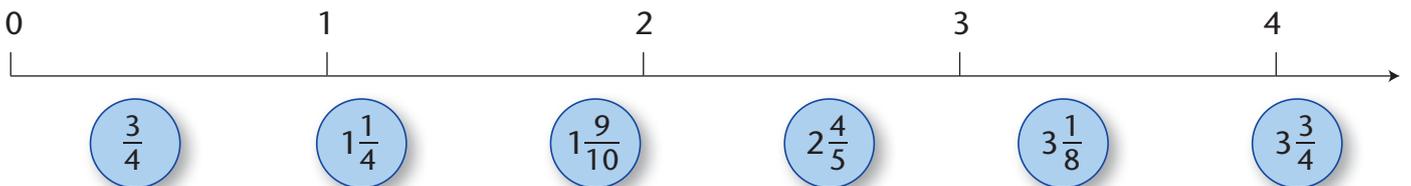
Comparing and ordering fractions

1 Draw an arrow to match each fraction with its place on the number line.

$10\ \frac{1}{8}\ \frac{2}{8}\ \frac{3}{8}\ \frac{4}{8}\ \frac{5}{8}\ \frac{6}{8}\ \frac{7}{8}\ 11\qquad\qquad 12\qquad\qquad 13\qquad\qquad 14$

$10\frac{1}{4}$ $10\frac{5}{8}$ $11\frac{1}{8}$ $11\frac{7}{8}$ $12\frac{3}{4}$ $13\frac{3}{8}$ $14\frac{1}{8}$

2 Draw an arrow to match each fraction with its place on the number line.

$0\ \frac{2}{10}\ \frac{4}{10}\ \frac{6}{10}\ \frac{8}{10}\ 1\qquad\qquad 2\qquad\qquad 3\qquad\qquad 4\qquad\qquad 5$

$\frac{1}{10}$ $\frac{1}{5}$ $1\frac{3}{10}$ $2\frac{9}{10}$ $3\frac{4}{5}$ $4\frac{7}{10}$ $4\frac{4}{10}$ $5\frac{2}{5}$

3 Draw a line to show your estimate of each fraction on the number line.

$0\qquad\qquad 1\qquad\qquad 2\qquad\qquad 3\qquad\qquad 4$

$\frac{3}{4}$ $1\frac{1}{4}$ $1\frac{9}{10}$ $2\frac{4}{5}$ $3\frac{1}{8}$ $3\frac{3}{4}$

4 Order the fractions from smallest to largest.

a	$\frac{1}{2}$	$\frac{1}{8}$	$\frac{1}{4}$	
b	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{1}{4}$	
c	$\frac{7}{8}$	$\frac{3}{8}$	$\frac{6}{8}$	
d	$\frac{7}{8}$	$\frac{1}{2}$	$\frac{1}{4}$	

e	$2\frac{1}{2}$	$1\frac{7}{8}$	$2\frac{1}{8}$	
f	$1\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{3}{8}$	
g	$1\frac{3}{5}$	$1\frac{3}{4}$	$2\frac{1}{5}$	
h	$1\frac{3}{5}$	$1\frac{3}{10}$	$1\frac{1}{2}$	

5 Continue the counting sequences and write the rule in the box. The first rule is written for you.

Rule

a | $\frac{3}{4}$ | 1 | $1\frac{1}{4}$ | $1\frac{1}{2}$ | | | | $+\frac{1}{4}$

c | 10 | $9\frac{1}{2}$ | 9 | $8\frac{1}{2}$ | | | | Rule

b | $1\frac{1}{4}$ | $1\frac{3}{4}$ | $2\frac{1}{4}$ | $2\frac{3}{4}$ | | | |

d | 8 | $7\frac{3}{4}$ | $7\frac{1}{2}$ | $7\frac{1}{4}$ | | | |

6 Make up 2 fraction counting sequences of your own.

a

b

Compare fractions with related denominators and locate and represent them on a number line

Understanding, Fluency
L N

7 Round these numbers to the nearest 100 and complete the operations.

> Numbers ending in 50 are rounded up.

a 581 + 316 ≈ _____   e 801 − 795 ≈ _____

b 750 + 124 ≈ _____   f 550 + 249 ≈ _____

c 901 − 739 ≈ _____   g 929 − 579 ≈ _____

d 820 − 298 ≈ _____   h 568 − 429 ≈ _____

8 Round these numbers to the nearest 1000 to complete the multiplications.

> Numbers ending in 500 are rounded up.

a 4998 × 6 ≈ _____   e 3808 × 4 ≈ _____

b 5223 × 5 ≈ _____   f 5880 × 7 ≈ _____

c 7989 × 8 ≈ _____   g 9123 × 4 ≈ _____

d 4103 × 3 ≈ _____   h 4500 × 5 ≈ _____

9 Round these decimals to the nearest whole number to complete the operations.

> Numbers ending in .50 are rounded up.

a 4.95 × 3 ≈ _____   e 4.89 + 3.17 ≈ _____

b 6.11 × 8 ≈ _____   f 8.50 − 4.93 ≈ _____

c 3.89 × 7 ≈ _____   g 9.32 − 5.41 ≈ _____

d 4.05 × 6 ≈ _____   h 7.50 − 0.99 ≈ _____

Many advertisements that deal in large numbers use a **K** to show thousands.
E.g. 23K = 23 000.
The **K** is an abbreviation for the Greek word *khilioi* which means thousand.

10 Write each of these numbers using K as an abbreviation.

a 7000 = 7K   d 13 000 =   g 336 000 =

b 3000 =   e 27 000 =   h 474 000 =

c 9000 =   f 18 000 =   i 556 000 =

11 Round each number in the number sentences below to the nearest 1000 and estimate an answer for each. Record your answer in an abbreviated form using a K.

	Question	Estimate
a	1249 + 1958	3 K
b	2896 + 3107	
c	5777 + 3699	
d	7777 + 6666	
e	5977 + 5017	

	Question	Estimate
f	29 864 + 3207	
g	35 977 + 5103	
h	36 102 + 8798	
i	37 901 + 5109	
j	55 354 + 9999	

POSITION VACANT

Accountant

Must be fully qualified and willing to work long hours.
CPA accredited.

Salary $96K

Fluency, Understanding
CCT N

Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers

61

12 Solve the problems and explain the strategy you used.

a Which town did we travel to if we drove for $2\frac{1}{2}$ hours at the average speed of 80 km/h?

STURT 120 km
ELMO 180 km
BLUEY 200 km

_____

Strategy: _____

_____

_____

b **Hire Cars** We need to hire a car for a 3-hour trip.
Which of the three options do you think we should take? _____

Explain your reasons: _____

1 1 hr = $25 _____

2 $\frac{1}{2}$ day = $70 _____

3 Day = $120 _____

c Amy is paid $10 an hour but if she works on weekends she receives $1\frac{1}{2}$ times her normal rate. How much would she receive if she worked 6 hours last Saturday?

_____
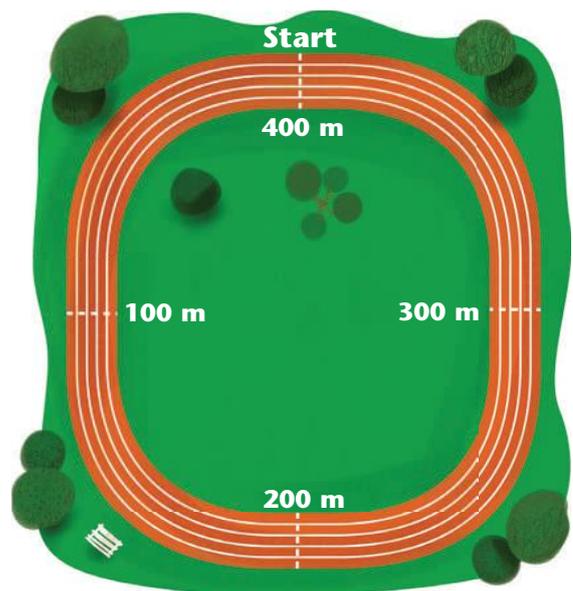
Strategy: _____

_____

_____

13 Josh and Andrew are running around a 400-metre track.

Their running rates are:
Josh—100 metres per 15 seconds
Andrew—100 metres per 20 seconds

Start

400 m

100 m   300 m

200 m
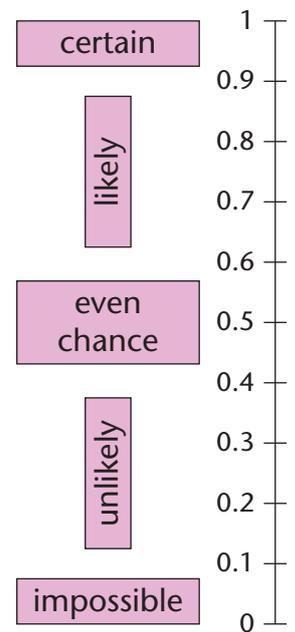
a Place a **J** on the track where Josh will be after 30 seconds and an **A** on the track where Andrew will be.

b How far apart will they be after 1 minute?

_____

c How long will it take each of them to run one kilometre? Josh: _____ Andrew: _____

Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers

Problem solving, Reasoning
N CCT

14 Rate the likelihood of these events happening, using the range of 0 to 1.
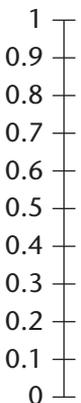
	Event	Probability
a	A female will enter the room next.	
b	We will have ice-cream tonight.	
c	We will get maths homework tonight.	
d	We will have our school photos today.	
e	It will rain today.	
f	A coin will land on heads.	
g	A person is left-handed.	
h	A spinner numbered 1 to 5 lands on 3.	
i	A baby will be born a boy.	

certain — 1
likely — 0.9, 0.8, 0.7
even chance — 0.6, 0.5, 0.4
unlikely — 0.3, 0.2
impossible — 0.1, 0

15 Draw a line to display the chance on the scale of 0 to 1 of each colour being drawn from the bag.

a Red
b Blue
c Yellow
d Green

1, 0.9, 0.8, 0.7, 0.6, 0.5, 0.4, 0.3, 0.2, 0.1, 0

16 Draw a line to display the chance on a scale of 0% to 100% of each of 100 ships leaving Australia for its destination.

Destination	Number
Pacific Islands	40
Europe	30
USA	20
Canada	10

a Europe
b Pacific Islands
c Canada
d USA

100%, 90%, 80%, 70%, 60%, 50%, 40%, 30%, 20%, 10%, 0%
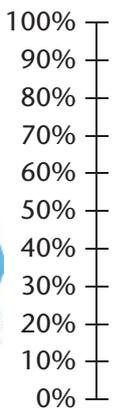
17 Write an event and a chance rating from 0 to 1 to match it.

Division with fractional remainders

Changing remainders into common fractions

Remainders can be written as a common fraction by dividing the remainder by the divisor. In this division the remainder of 1 is divided by 4 to become $\frac{1}{4}$.

$$4\overline{)25} \quad \overset{6r1}{} \quad \text{becomes } 6\frac{1}{4}$$

1 Complete these divisions, writing the remainders as a fraction. The first one has been done for you.

a $3\overline{)4^12\,5^20}$ = $1\,4\,1\,6\frac{2}{3}$

b $4\overline{)5\,6\,5\,7}$ c $5\overline{)6\,5\,5\,7}$ d $6\overline{)7\,8\,7\,4}$ e $4\overline{)5\,3\,6\,7}$

f $6\overline{)7\,5\,2\,3}$ g $4\overline{)5\,6\,7\,8}$ h $5\overline{)7\,3\,9\,7}$ i $3\overline{)5\,4\,7\,5}$ j $6\overline{)7\,6\,9\,0}$

2 Complete these divisions on your calculator. In each case your calculator will display the remainder as a decimal fraction.

a $8\overline{)9\,7\,5\,4}$ b $4\overline{)5\,5\,3\,7}$ c $4\overline{)5\,2\,8\,7}$ d $5\overline{)7\,4\,2\,7}$

e $5\overline{)8\,5\,4\,6}$ f $5\overline{)6\,4\,0\,7}$ g $8\overline{)5\,6\,5\,8}$ h $4\overline{)9\,6\,7\,0}$

$\frac{2}{8} = 0.25$
$\frac{4}{5} = 0.8$

3 Solve the problems.

a 748 centicubes were shared among 4 girls. How many centicubes did each girl receive?

b 975 leaflets were distributed to 5 selected streets. How many leaflets were delivered to each street?

c Sheree's netball team scored 376 goals in 8 games. What was the average score for each game?

d Mark scored 628 runs in 10 innings. What is his average score?

4 Complete the number cross.

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

Across
1 123 ÷ 3 =
3 296 ÷ 8 =
4 924 ÷ 2 =
6 384 ÷ 6 =
8 381 ÷ 3 =
10 64 ÷ 8 =
11 855 ÷ 5 =
13 729 ÷ 9 =
17 840 ÷ 4 =
18 581 ÷ 7 =

Down
2 252 ÷ 2 =
3 160 ÷ 5 =
5 705 ÷ 3 =
7 882 ÷ 7 =
9 469 ÷ 7 =
12 858 ÷ 6 =
14 150 ÷ 10 =
15 288 ÷ 4 =
16 640 ÷ 8 =

Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers

Fluency, Problem solving
CCT N

Fraction wall

1 Whole								Whole

$\frac{1}{2}$	$\frac{2}{2}$	Halves

$\frac{1}{4}$	$\frac{2}{4}$	$\frac{3}{4}$	$\frac{4}{4}$	Quarters

$\frac{1}{8}$	$\frac{2}{8}$	$\frac{3}{8}$	$\frac{4}{8}$	$\frac{5}{8}$	$\frac{6}{8}$	$\frac{7}{8}$	$\frac{8}{8}$	Eighths

$\frac{1}{3}$	$\frac{2}{3}$	$\frac{3}{3}$	Thirds

$\frac{1}{6}$	$\frac{2}{6}$	$\frac{3}{6}$	$\frac{4}{6}$	$\frac{5}{6}$	$\frac{6}{6}$	Sixths

$\frac{1}{12}$	$\frac{2}{12}$	$\frac{3}{12}$	$\frac{4}{12}$	$\frac{5}{12}$	$\frac{6}{12}$	$\frac{7}{12}$	$\frac{8}{12}$	$\frac{9}{12}$	$\frac{10}{12}$	$\frac{11}{12}$	$\frac{12}{12}$	Twelfths

$\frac{1}{5}$	$\frac{2}{5}$	$\frac{3}{5}$	$\frac{4}{5}$	$\frac{5}{5}$	Fifths

$\frac{1}{10}$	$\frac{2}{10}$	$\frac{3}{10}$	$\frac{4}{10}$	$\frac{5}{10}$	$\frac{6}{10}$	$\frac{7}{10}$	$\frac{8}{10}$	$\frac{9}{10}$	$\frac{10}{10}$	Tenths

5 Use the fraction wall to add or subtract these unlike fractions.

a $\frac{1}{5} + \frac{1}{10} = $ ___

b $\frac{1}{5} + \frac{3}{10} = $ ___

c $\frac{2}{5} + \frac{2}{10} = $ ___

d $\frac{1}{4} + \frac{1}{8} = $ ___

e $\frac{3}{4} + \frac{1}{12} = $ ___

f $\frac{1}{2} + \frac{1}{12} = $ ___

g $\frac{3}{5} + \frac{1}{10} = $ ___

h $\frac{1}{3} + \frac{1}{6} = $ ___

i $\frac{1}{2} + \frac{3}{10} = $ ___

j $\frac{1}{2} + \frac{1}{6} = $ ___

k $\frac{2}{8} + \frac{1}{12} = $ ___

l $\frac{1}{3} + \frac{2}{6} = $ ___

m $\frac{4}{5} - \frac{1}{10} = $ ___

n $\frac{2}{3} - \frac{1}{12} = $ ___

o $\frac{3}{5} - \frac{3}{10} = $ ___

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

q $\frac{1}{4} - \frac{1}{12} = $ ___

r $\frac{9}{10} + \frac{3}{5} = $ ___

> **Think!**
> $\frac{1}{4} + \frac{1}{12}$
> $\frac{3}{12} + \frac{1}{12} = \frac{4}{12}$

6 Add these fractions. You will need to change the mixed numeral into an improper fraction. The first one has been done for you.

a $\frac{5}{6} + \frac{2}{6} = \frac{7}{6} = 1\frac{1}{6}$

b $\frac{4}{5} + \frac{3}{10} = $ ___ $ = $ ___

c $\frac{3}{4} + \frac{5}{8} = $ ___ $ = $ ___

d $\frac{7}{8} + \frac{3}{4} = $ ___ $ = $ ___

e $\frac{3}{5} + \frac{7}{10} = $ ___ $ = $ ___

f $\frac{5}{8} + \frac{3}{4} = $ ___ $ = $ ___

g $\frac{9}{10} + \frac{2}{5} = $ ___ $ = $ ___

h $\frac{11}{12} + \frac{1}{4} = $ ___ $ = $ ___

i $\frac{2}{3} + \frac{5}{6} = $ ___ $ = $ ___

j $\frac{7}{10} + \frac{4}{5} = $ ___ $ = $ ___

k $\frac{9}{12} + \frac{1}{2} = $ ___ $ = $ ___

l $\frac{3}{4} + \frac{5}{8} = $ ___ $ = $ ___

m $\frac{8}{10} + \frac{2}{5} = $ ___ $ = $ ___

n $\frac{9}{12} + \frac{3}{4} = $ ___ $ = $ ___

o $\frac{2}{3} + \frac{3}{6} = $ ___ $ = $ ___

p $\frac{6}{10} + \frac{3}{5} = $ ___ $ = $ ___

q $\frac{7}{12} + \frac{5}{6} = $ ___ $ = $ ___

r $\frac{5}{6} + \frac{7}{12} = $ ___ $ = $ ___

> **Think!**
> $\frac{4}{5} + \frac{3}{10}$
> $\frac{8}{10} + \frac{3}{10} = \frac{11}{10} = 1\frac{1}{10}$

7 **a** Build the geometric pattern of triangles with matches, then sketch the next set of triangles in the sequence.
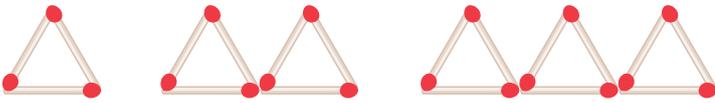
b Complete and extend the table to record the number of matches needed to make the pattern of triangles.

c In small groups discuss a rule to describe the number pattern formed by the triangles, then write it.

Triangles	1	2	3	4	5	6	7
Matches	3	6					

d Use the rule to state how many matches would be needed for 15 triangles.

8 **a** Build the pattern of pentagons with matches, then sketch the next set of pentagons.
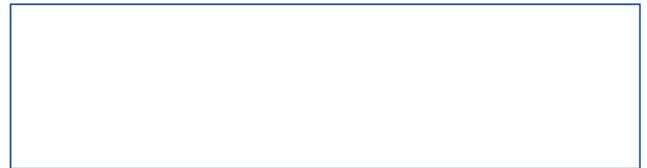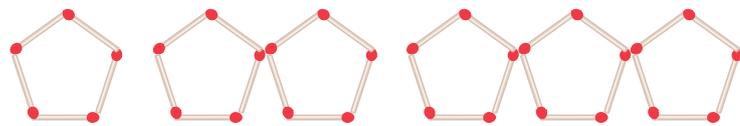
b Complete and extend the table to record the number of sides needed to make the pattern of pentagons.

c Write a rule to describe the pattern.

Pentagons	1	2	3	4	5	6	7
Sides	5						

d How many sides would there be on 10 pentagons?

9 **a** Build the pattern of squares with matches, then sketch the next set of squares.
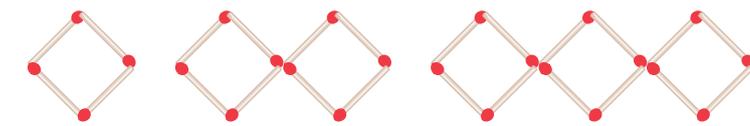
b Complete and extend the table to record the number of sides needed to make the pattern of squares.

c Write a rule to describe the pattern.

Squares	1	2	3	4	5	6	7
Sides	4						

d How many sides would there be on 12 squares?
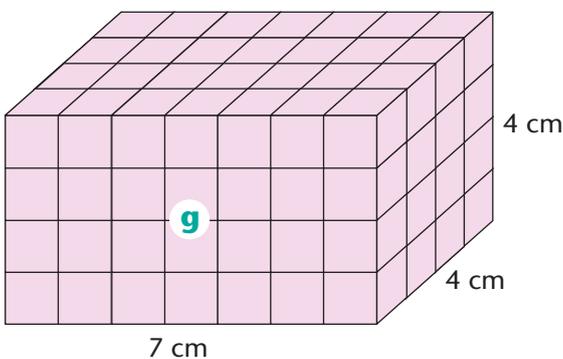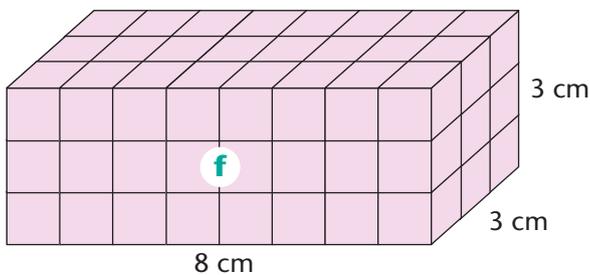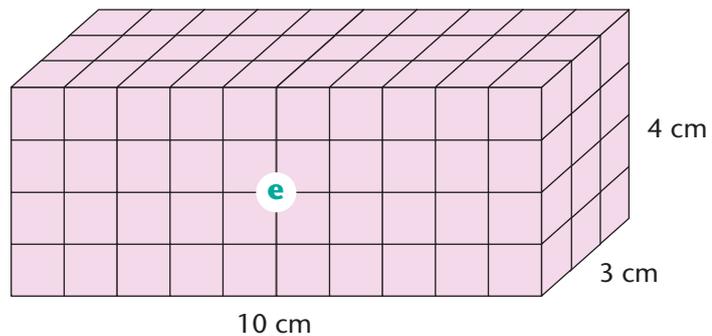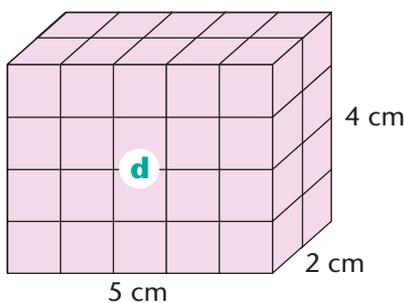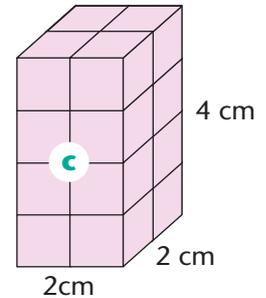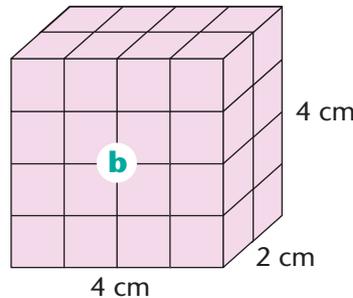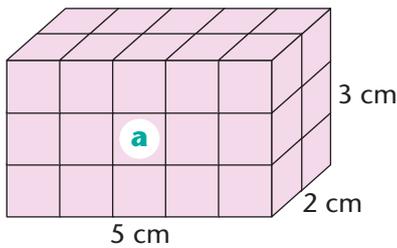
10 Write a rule to describe the triangle pattern below.

1   3   5   7   9
2   4   6   8   10

Rule _____

Continue and create sequences involving whole numbers, fractions and decimals.   Understanding, Reasoning
Describe the rule used to create the sequence   N L CCT
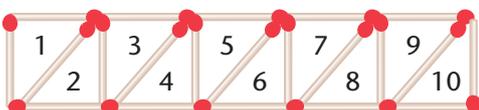
11 Calculate the volume of each model made from centicubes. Record the data on the grid below.

12 Order the volumes from the smallest to largest by numbering them from 1 to 7.

a — 5 cm, 2 cm, 3 cm

b — 4 cm, 2 cm, 4 cm

c — 2cm, 2 cm, 4 cm

d — 5 cm, 2 cm, 4 cm

e — 10 cm, 3 cm, 4 cm

f — 8 cm, 3 cm, 3 cm

g — 7 cm, 4 cm, 4 cm
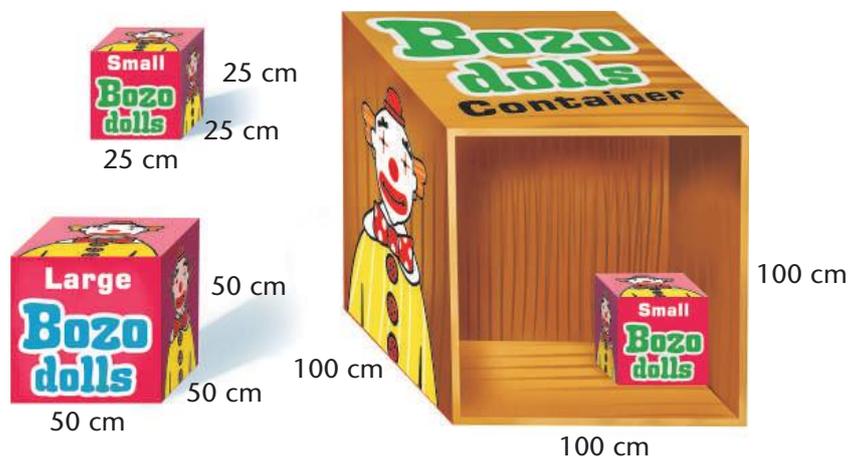
Shape	Area of base (Length × Width)	Number of layers (Height)	Total number of cubes in model	Order
a				
b				
c				
d				
e				
f				
g				

13 **Select the unit**

a How many large Bozo Dolls can be packed neatly into the container?

_____

b How many small Bozo Dolls will fit into the container?

_____

Small Bozo dolls — 25 cm, 25 cm, 25 cm

Large Bozo dolls — 50 cm, 50 cm, 50 cm

Bozo dolls Container — 100 cm, 100 cm, 100 cm

1 Discuss the following multiplication example with your teacher.

```
      1 2 1
      3 2 3
  ×     4 7
  ─────────
      2 2 6 1
  1 2 9 2 0
  ─────────
  1 5 1 8 1
```

323 × 7 ones = 2261

323 × 4 tens = 12 920
Zero holds a place in the ones column.

2261 + 12 920 = 15 181

2 Pretend that you are teaching this method of multiplication to a friend. Complete the tags to explain each part.

```
    2 3 4
  ×   2 3
  ─────────


  ─────────
```

234 x 23 is the same as 234 x 3 plus 234 x 20.

3 Complete these multiplications.

a
```
    1 2 4
  ×   7 2
```

b
```
    2 3 4
  ×   2 5
```

c
```
    3 1 7
  ×   3 4
```

d
```
    4 2 7
  ×   2 6
```

e
```
    6 1 2
  ×   3 4
```

f
```
    4 3 4
  ×   2 3
```

g
```
    6 1 4
  ×   4 5
```

h
```
    2 7 2
  ×   1 8
```

i
```
    5 0 1
  ×   2 9
```

j
```
    1 3 6
  ×   2 7
```

4 Calculate how much money each worker would save.

a Bank Book
How much would Spiro save in 12 weeks if he saved $272 each week?

b Bank Book
Billy saved $453 each week for 15 weeks. What were his total savings?

c B·A·N·K book
How much would Maria save in 46 weeks if she saved $354 each week?

d Bank Book
Jean saved $368 each week for 27 weeks. What were her total savings?

Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers

Problem solving, Understanding
N CCT

5 Follow the instructions to answer the questions.
This machine makes 20 milk cartons every minute.

Minutes	1	2	3	4	5	6	7
Cartons	20						

Rule: _____

a Complete the number pattern and record the rule.

b How many cartons would the machine make in 10 minutes? _____

This bath fills at a rate of 15 litres every minute.

Minutes	1	2	3	4	5	6	7
Litres	15						

Rule: _____

c Complete the number pattern and record the rule.

d How many litres would be in the bath after 12 minutes? _____

This car travels 13 km on every litre of petrol.

Litres	1	2	3	4	5	6	7
Kilometres	13						

Rule: _____

e Complete the number pattern and record the rule.

f How far would the car travel on 15 L of petrol? _____

Radio station Double Z plays 12 songs every hour.

Hours	1	2	3	4	5	6	7
Songs	12						

Rule: _____

g Complete the number pattern and record the rule.

h How many songs would be played in 12 hours? _____

6 **The walking track**

Hansel is walking at a rate of 50 metres per minute. Gretel is jogging at a rate of 75 metres per minute. Each flag on the track is 75 metres apart.
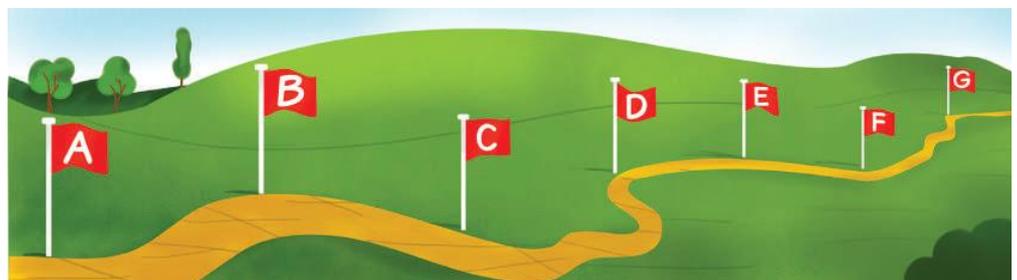
a How long will it take Hansel to travel 150 m?

b How far will Gretel travel in 3 minutes?

c How far apart will they be after 5 minutes?

d Draw Gretel at G.

e Draw Hansel on the track if Gretel is at G.

f If Gretel was on D, how long would it have taken?

7 Construct a rectangle and a square from the given directions.

a Place a set square along line *AB* with the right angle on *A*.

A   *B*
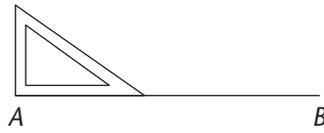
b Draw a faint vertical line to form a 90° angle at *A*.

c Repeat the procedure for *B*.

A   *B*

d Measure 6 cm up each vertical line and put in a dot.

A   *B*

e Join the dots and firm in the rectangle.

f Draw diagonals on your rectangle. (If both measure the same, you have constructed a true rectangle.)

g How many sets of parallel sides has a rectangle? _____

h How many lines of symmetry has a rectangle? _____

A   *B*

8 Follow the directions and construct a square.

a Repeat the procedure above to create a 6 cm square.

b Draw in the diagonals.

c Are they the same length? _____

d How many lines of symmetry has a square? _____

A   *B*

9 Convert these measurements into tonnes using decimal notation. E.g. 2500 kg = 2.5 t

a 3563 kg = _____ t   e 8504 kg = _____ t   i 356 kg = _____ t

b 7462 kg = _____ t   f 23034 kg = _____ t   j 742 kg = _____ t

c 8754 kg = _____ t   g 6705 kg = _____ t   k 86 kg = _____ t

d 6077 kg = _____ t   h 50267 kg = _____ t   l 6 kg = _____ t

10 How many of each box could you pack onto a 1-t truck?

a
Net
Mass
2 kg
☐

b
Net
Mass
4 kg
☐

c
Net
Mass
8 kg
☐

Some extremely small amounts of mass like dosages of medicine are measured in **milligrams. 1000 mg = 1 g**

11 Choose a measuring unit from the box to measure the mass of:

milligrams **mg**   grams **g**
tonnes **t**   kilograms **kg**

a Your mass _____   f A small tablet _____

b An elephant _____   g A truck _____

c A ruler _____   h A key _____

d A bag of potatoes _____   i A box of books _____

e A hair _____   j A pen _____

12 Convert these mass units to another.

a 5 t = _____ kg   e 2.5 kg = _____ g   i 3 g = _____ mg

b 2.5 t = _____ kg   f 1.5 kg = _____ g   j 2000 mg = _____ g

c 2 kg = _____ g   g $\frac{1}{2}$ kg = _____ g   k 3500 g = _____ kg

d 6 kg = _____ g   h 1 g = _____ mg   l 2250 kg = _____ t

13 Solve the problems.

a A jar of jelly beans has a mass of 1 kg. If the jar's mass is 210 g what is the mass of the jelly beans? ☐

b How many 65 kg sacks of potatoes can be made up from a load with a mass of 1.040 tonnes? ☐

c If 20 apples have a combined mass of 4 kg, what is the average mass of each apple? ☐

d The maximum load permitted on a truck is 5 tonnes. What would be the mass of 35 containers each of 145 kg? Would this load be permitted on the truck? ☐

Fractions of a quantity

To find $\frac{3}{4}$ of a quantity you must first find one-quarter $\frac{1}{4}$ then multiply it by the numerator 3 to find $\frac{3}{4}$. E.g. $\frac{3}{4}$ of 24 ⟶ $\frac{1}{4}$ of 24 = 6 ⟶ 6 × 3 = 18 ⟶ $\frac{3}{4}$ of 24 = 18

1 Find the fractions in the bag of marbles.

$\frac{2}{3}$ of 36
Think $\frac{1}{3}$ of 36 = 12.
12 x 2 = 24

a $\frac{1}{4}$ of 36 = _____ h $\frac{5}{6}$ of 36 = _____

b $\frac{1}{3}$ of 36 = _____ i $\frac{5}{12}$ of 36 = _____

c $\frac{1}{12}$ of 36 = _____ j $\frac{7}{12}$ of 36 = _____

d $\frac{1}{9}$ of 36 = _____ k $\frac{3}{6}$ of 36 = _____

e $\frac{1}{6}$ of 36 = _____ l $\frac{11}{12}$ of 36 = _____

f $\frac{2}{3}$ of 36 = _____ m $\frac{5}{18}$ of 36 = _____

g $\frac{3}{4}$ of 36 = _____

2 Find the fraction of each group.

a $\frac{2}{3}$ of 30 = _____ f $\frac{2}{3}$ of 120 = _____ k $\frac{2}{6}$ of 420 = _____

b $\frac{2}{3}$ of 90 = _____ g $\frac{5}{12}$ of 240 = _____ l $\frac{5}{6}$ of 120 = _____

c $\frac{2}{3}$ of 60 = _____ h $\frac{3}{4}$ of 480 = _____ m $\frac{7}{12}$ of 120 = _____

d $\frac{2}{5}$ of 45 = _____ i $\frac{3}{4}$ of 240 = _____ n $\frac{5}{12}$ of 144 = _____

e $\frac{2}{5}$ of 75 = _____ j $\frac{3}{5}$ of 200 = _____ o $\frac{7}{12}$ of 144 = _____

3 Solve the problems.

a Mrs Lahood saved $360. If she spent $\frac{5}{6}$ of it on electricity, how much did she pay?

c Jacqui has saved $250 towards an overseas trip. If she had to spend $\frac{3}{5}$ on a doctor's bill, how much would she have left?

b Mr Zlatco earns $490 per week but spends $\frac{6}{7}$ of it on bills and groceries. How much does he have left for himself?

d Tom had a bag of 288 marbles but he lost $\frac{3}{4}$ of them. How many marbles did he have left?

4 Find the quantities.

a 10% of $200 _____ c 0.5 of $40 _____ e 0.1 of $50 _____

b 25% of $60 _____ d 0.25 of $80 _____ f 25% of $800 _____

5 Write as many fractions of collections as you can for the number 25.

$\frac{1}{4}$ of 100 = 25

Applying addition to solve problems

6 Use the chart below to calculate the distance between airports and the total distance of each journey. Round each distance to the nearest 100 km to estimate the answer and then calculate the actual distance. The first one has been done for you.

Kilometre chart

	Adelaide	Alice Springs	Brisbane	Burnie (Wynyard)	Cairns	Canberra	Darwin	Devonport	Gold Coast	Gove	Hamilton Island	Hobart	Launceston	Mackay	Melbourne	Mt Isa	Perth	Proserpine	Rockhampton	Sydney	Townsville
Adelaide		1320	1622	1025	2779	970	2624	1054	1605	3271	2506	1260	1055	2416	650	1994	2118	2515	2136	1166	2731
Alice Springs	1320		1966	2236	1459	2258	1305	2276	2059	1952	1973	2478	2336	2065	1860	674	1977	2864	2486	2022	1426
Brisbane	1622	1966		1754	1391	951	2852	1788	93	2484	888	1788	1662	797	1381	1572	3806	898	518	752	1112
Burnie (Wynyard)	1025	2235	1754		3146	845	3542	61	1708	4237	2340	N/A	N/A	2554	375	3326	3085	2652	2274	1081	2868
Cairns	2779	1459	1391	3146		2210	1677	2950	1485	1091	514	3299	3153	616	2679	785	3436	N/A	884	1974	285
Canberra	970	2258	951	845	2210		3392	879	916	3301	1764	1080	938	1783	470	2556	3180	1881	1504	237	1928
Darwin	2624	1305	2852	3542	1677	3392		3576	2945	647	2191	3788	3647	2347	3178	1297	2653	N/A	2627	3155	2021
Devonport	1054	2276	1788	61	2950	879	3576		1587	4183	2374	N/A	N/A	2456	409	3360	3119	2686	2308	908	2902
Gold Coast	1605	2059	93	1708	1485	916	2945	1587		2576	983	1719	1595	893	1333	1665	3700	991	613	679	1207
Gove	3271	1952	2484	4237	1091	3301	647	4183	2576		1605	4384	4242	1707	3862	1944	3300	N/A	1987	3065	1376
Hamilton Island	2506	1973	888	2340	514	1764	2191	2374	983	1605		2575	2433	95	1965	2462	4807	N/A	372	1528	260
Hobart	1260	2478	1788	N/A	3299	1080	3788	N/A	1719	4384	2575		145	2793	610	3566	3320	2891	2514	1040	3107
Launceston	1055	2336	1662	N/A	3153	938	3647	N/A	1595	4242	2433	145		2651	468	3502	3178	2560	2372	916	2965
Mackay	2416	2065	797	2554	616	1783	2347	2456	893	1707	95	2793	2651		2163	2373	4589	N/A	280	1548	901
Melbourne	650	1860	1381	375	2679	470	3178	409	1333	3862	1965	610	468	2163		2644	2710	2273	1883	706	2493
Mt Isa	1994	674	1572	3326	785	2556	1297	3360	1665	1944	2462	3566	3502	2373	2644		2653	N/A	2092	2322	1070
Perth	2118	1977	3606	3085	3436	3180	2653	3119	3700	3300	4807	3320	3178	4589	2710	2653		4928	4310	3279	3721
Proserpine	2515	2864	898	2652	N/A	1881	N/A	2686	991	N/A	N/A	2891	2560	N/A	2273	N/A	4928		382	1644	N/A
Rockhampton	2136	2486	518	2274	884	1504	2627	2308	613	1987	372	2514	2372	280	1883	2092	4310	382		1177	N/A
Sydney	1167	2022	752	1081	1974	237	3155	908	679	3065	1528	1040	916	1548	706	2322	3279	1644	1177		1692
Townsville	2731	1426	1112	2868	285	1928	2021	2902	1207	1376	260	3107	2965	901	2493	1070	3721	N/A	N/A	1692	
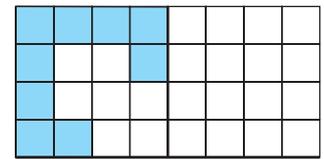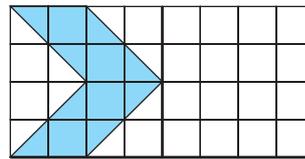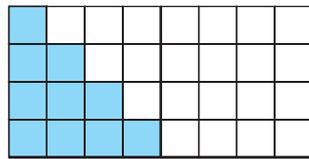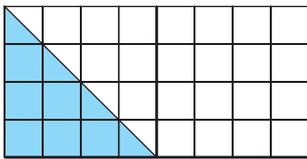
Flight	Journey	Estimate	Distance
a	Darwin to Gove to Alice Springs	2600	647 km + 1952 km = 2599 km
b	Brisbane–Melbourne–Hobart		
c	Darwin–Alice Springs–Mt Isa		
d	Adelaide–Canberra–Brisbane		
e	Brisbane–Canberra–Melbourne		
f	Hobart–Melbourne–Canberra		
g	Gove–Cairns–Mackay		

7 Mark 2 flights on the map. Colour one blue and the other red. Calculate the total distance of each flight.

Blue flight	
Red flight	
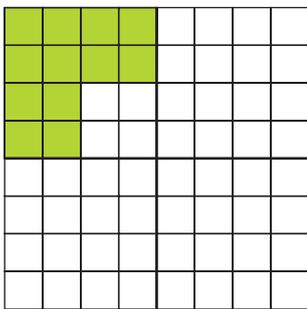
8 Reflect each shape.
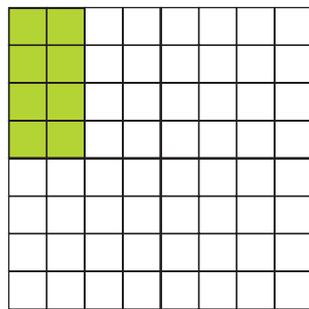
9 Rotate each shape as directed.
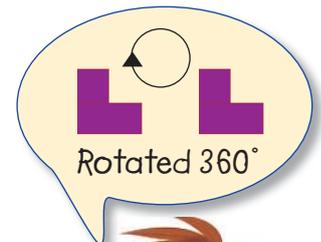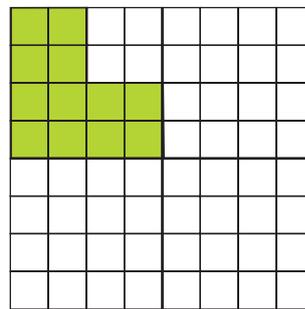
a 90° clockwise   **b** 180° clockwise   **c** 270° clockwise

Rotated 360°

10 Translate each shape as directed.
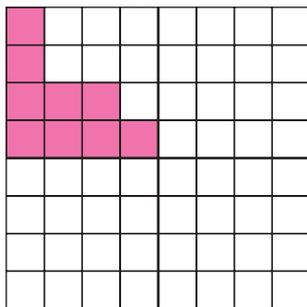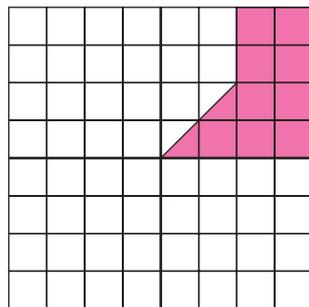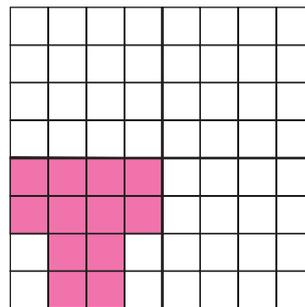
a Directly below   **b** To the left   **c** Directly above   **d** To the right
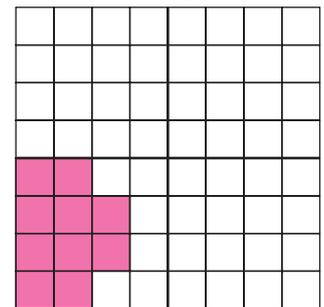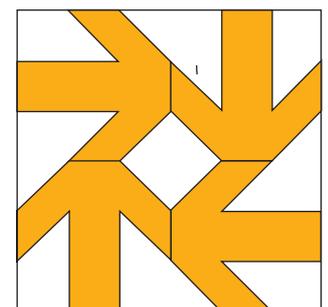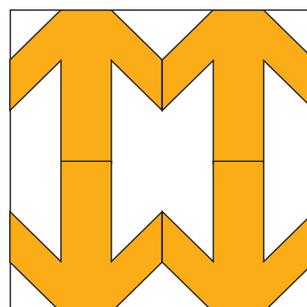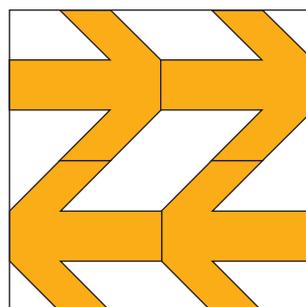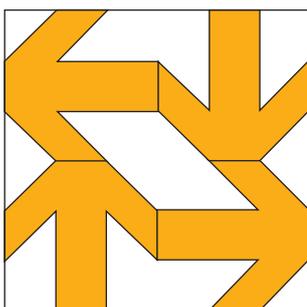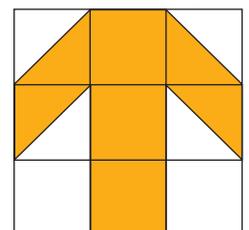
e Does moving the shapes, as above, in any way change their shape or size? _____

11 Create a tessellating pattern through shape movements.

1-cm graph paper

a Draw 4 arrows identical to the one displayed on four pieces of graph paper measuring 3 cm × 3 cm.

b Cut out the 4 squares and translate, rotate and reflect them to make the four patterns below.

74
Investigate combinations of translations, reflections and rotations, with and without the use of digital technologies

Reasoning, Problem solving
CCT N

Cubic centimetres and millilitres

A small unit for measuring capacity is the **millilitre**.　　1000 **mL** = 1 L

12 Estimate and measure the capacity of each of these small vessels in millilitres (mL).
(You may need a medicine glass or a 1-mL eye dropper.)

a teaspoon　　　　**b** tea-cup　　　　**c** screwcap　　　　**d** mug

Estimate: _____　Estimate: _____　Estimate: _____　Estimate: _____

Capacity: _____　Capacity: _____　Capacity: _____　Capacity: _____

13 Does 1 cubic centimetre displace one millilitre of water?
Conduct this experiment to see.
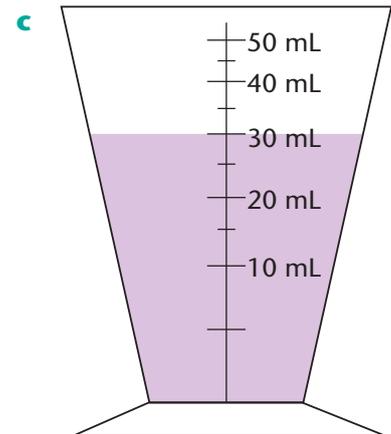
Use a measuring glass filled to 30 mL to measure the water displaced by cubic
centimetres (centicubes). Colour the new water levels on each measuring glass below.

a
50 mL
40 mL
30 mL
20 mL
10 mL

b
50 mL
40 mL
30 mL
20 mL
10 mL

c
50 mL
40 mL
30 mL
20 mL
10 mL
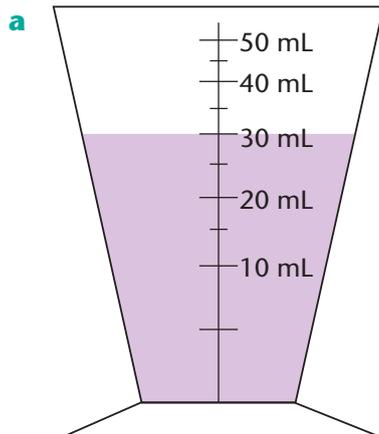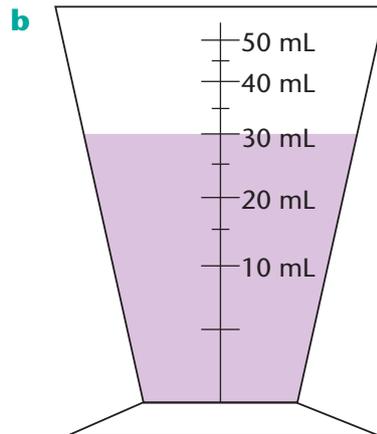
$5\ cm^3$
(5 centicubes)

$10\ cm^3$
(10 centicubes)

$15\ cm^3$
(15 centicubes)

d Did you notice any relationship between the cubic centimetres and the water
displaced by them? _____

e What is it? _____

_____

_____

14 How many centicubes (cm^3) would be needed to displace 100 mL? _____

Diagnostic review 2

PART 1

Complete the additions and subtractions.

a
```
    5 7 . 4 2
  + 3 5 . 6 9 6
  _____
```

b
```
    6 2 . 4 7 9
  + 3 5 . 7 7 8
  _____
```

c
```
    3 5 . 7 4 7
  − 2 7 . 3 6 3
  _____
```

d
```
    3 5 . 2 3 5
  − 2 1 . 7 7
  _____
```

e Petra cut a piece of timber measuring 3.567 m from a piece of timber measuring 5.985 m. How much timber was left?

PART 2

Complete the multiplications and divisions. Record any remainders as fractions.

a
```
    3 5 2 6
  ×       4
  _____
```

b
```
    2 7 4 5
  ×       6
  _____
```

c
```
    3 6 5 2
  ×       8
  _____
```

d $8\overline{)2066}$ **e** $7\overline{)7857}$ **f** $9\overline{)3878}$

g $6\overline{)7748}$ **h** $5\overline{)3777}$ **i** $4\overline{)3605}$

PART 3

Find the fraction of each group.

a $\frac{1}{4}$ of 48 =

b $\frac{1}{3}$ of 42 =

c $\frac{1}{5}$ of 250 =

d $\frac{1}{6}$ of 180 =

e $\frac{1}{12}$ of 3600 =

f $\frac{1}{8}$ of 5600 =

Peter bought $\frac{1}{5}$ of a 25-metre roll of carpet.

g How many metres did Peter buy? _____

h How many metres were left? _____

i What percentage of the carpet did Peter buy?

_____

PART 4

Complete these equations.

a $3 \times 7 + 6 =$

b $13 + 7 + 3 \times 9 =$

c $3 \times (7 + 6) =$

d $70 + 18 \div 3 + 10 =$

e $20 + (3 + 6) \times 7 =$

f $(100 - 25) \times 4 - 200 =$

PART 5

Complete the pattern and write a rule for it.

First number	1	2	3	4	5	6	7
Second number	6	12				36	

Rule: _____

PART 6

Write prime or composite after each number.

a 7 _____ **b** 23 _____

c 12 _____ **d** 49 _____

e Draw a line to estimate the place of each mixed numeral on the number line.

$2\frac{1}{2}$ $3\frac{1}{4}$ $4\frac{3}{4}$ $5\frac{7}{8}$
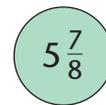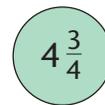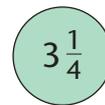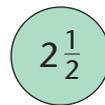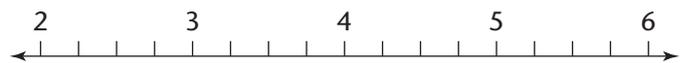
Order the fractions from least to greatest.

f $\boxed{2\frac{3}{4} \quad 3\frac{1}{2} \quad 2\frac{1}{4}}$

PART 7

Add the fractions to give an improper fraction. Then convert the fraction into a mixed numeral.

a $\frac{7}{8} + \frac{5}{8} =$ ____ = ____

b $\frac{8}{10} + \frac{4}{10} =$ ____ = ____

c $\frac{3}{10} + \frac{4}{10} + \frac{5}{10} =$ ____ = ____

d $\frac{5}{10} + \frac{8}{10} + \frac{9}{10} =$ ____ = ____

e $\frac{3}{8} + \frac{3}{8} + \frac{3}{8} =$ ____ = ____

f $\frac{4}{5} + \frac{4}{5} + \frac{4}{5} =$ ____ = ____

Subtract these fractions.

g $\frac{9}{12} - \frac{4}{12} =$ ____

h $\frac{9}{10} - \frac{3}{10} =$ ____

i $\frac{11}{12} - \frac{8}{12} =$ ____

j $\frac{5}{6} - \frac{1}{6} =$ ____

k $\frac{3}{4} - \frac{1}{4} =$ ____
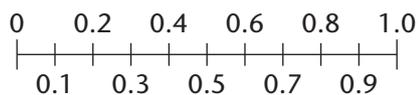
l $\frac{7}{8} - \frac{3}{8} =$ ____

Diagnostic review 2

PART 8
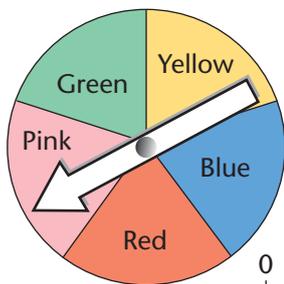
If 0 is impossible and 1 is certain, what is the probability of this spinner landing on red? Put a cross on the scale to show your answer.

0   0.2   0.4   0.6   0.8   1.0
   0.1   0.3   0.5   0.7   0.9

PART 9
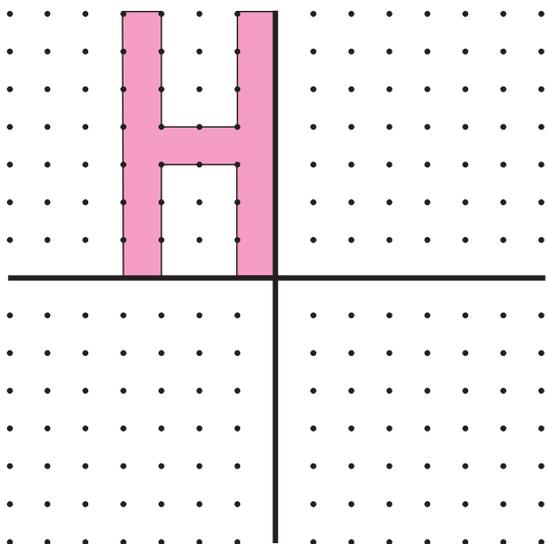
Construct these angles.

a 30°   **c** 100°

PART 10

Draw the three views of the shape as it is rotated 90° clockwise 3 times.

PART 11
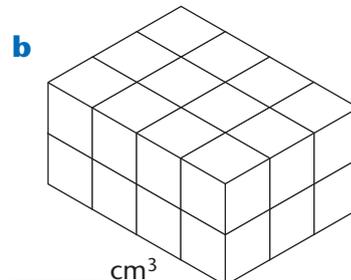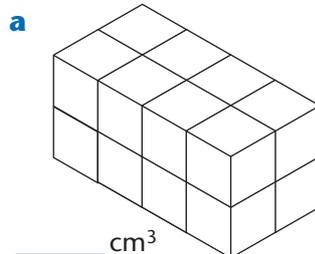
Convert these to different units.

a 6 tonne = _____ kg   **c** 4658 kg = _____ t
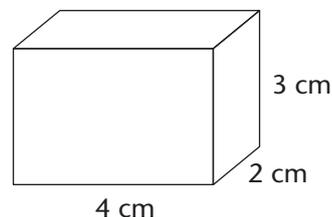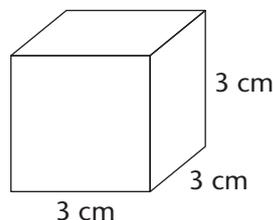
b 2.515 t = _____ kg   **d** 3496 kg = _____ t

PART 12

Calculate the volume of these cubes built from centicubes (1-cm cubes).

a   **b**

_____ cm^3 _____ cm^3
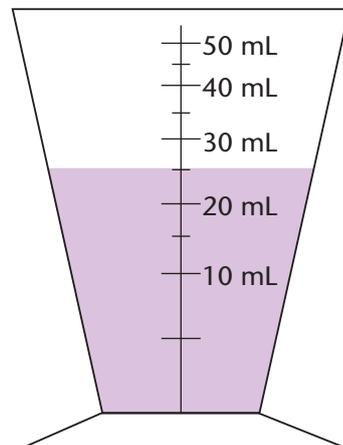
c Colour the shape with the larger volume.

3 cm   3 cm   3 cm

3 cm   3 cm   2 cm

3 cm   4 cm
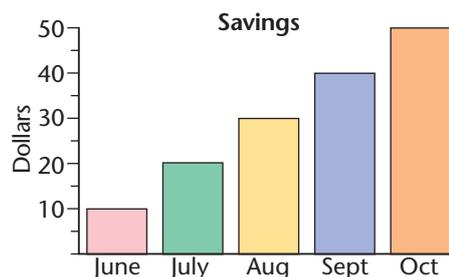
PART 13

If 25 centicubes with a volume of 25 cm^3 were added to the glass, show what the new level would be.

50 mL
40 mL
30 mL
20 mL
10 mL

25 cm^3
(25 centicubes)

PART 14

Savings

June July Aug Sept Oct

a How much was saved in August?   _____

b How much was saved in July?   _____

c What was the total amount saved?   _____

d What was the average amount saved?   _____

e Describe the pattern of savings.   _____

_____

Subtraction of 5- and 6-digit numbers

1 Before completing these subtractions round each number to the nearest 1000 to estimate the answer. Write your estimate in the box, then work out the exact answer.

a
```
  5 6 7 9 5
− 4 1 8 2 6
```

b
```
  7 9 3 5 8
− 4 2 1 7 2
```

c
```
  8 3 9 2 6
− 7 1 8 7 6
```

d
```
  5 9 3 0 8
− 4 1 7 2 6
```

e
```
  6 8 7 9 3
− 4 4 4 4 4
```

2 Use the front-end strategy to estimate these answers in the blue box before completing the full subtraction. E.g. 965 165 − 415 326 ≈ 500 000

a
```
  9 6 5 1 6 5
− 4 1 5 3 2 6
```

b
```
  7 2 9 5 4 6
− 2 7 5 4 9 3
```

c
```
  5 9 6 3 2 8
− 2 5 8 7 5 9
```

d
```
  5 0 9 3 1 6
− 4 2 8 6 5 4
```

e
```
  5 8 7 6 3 9
− 3 2 9 1 6 4
```

f
```
  6 9 3 8 2 4
− 3 2 7 6 5 8
```

g
```
  9 2 3 4 5 6
− 3 3 3 9 9 9
```

h
```
  9 8 7 6 5 4
− 6 5 9 8 3 6
```
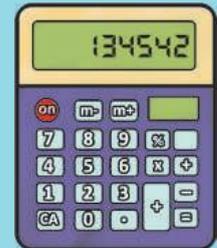
3 Jenny has just completed a subtraction on her calculator and came up with an answer of 134 542. Write a word problem that could have this number as its solution.

134542

4 Brendan has done some research on warships. Here is a summary of his information.

Type	HMAS Perth Destroyer	HMAS Otway Submarine	HMAS Newcastle Guided missile frigate	HMAS Fremantle Patrol boat
Commissioned	1965	1968	1994	1980
Crew	334	62	189	23
Length	134.34 m	91.40 m	138.10 m	42 m
Mass	4846 t	2456 t	3921 t	247 t
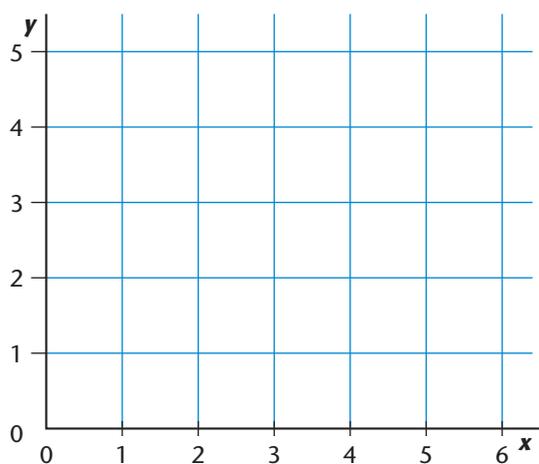
a What is the difference in age between *HMAS Perth* and *HMAS Newcastle*? _____

b How many more crew are on *HMAS Perth* than *HMAS Newcastle*? _____

c How much longer is *HMAS Perth* than *HMAS Otway*? _____

d What is the difference in mass between a destroyer and a patrol boat? _____

e What is the difference in mass between a frigate and a submarine? _____

f How much longer is *HMAS Newcastle* than *HMAS Perth*? _____

Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers

Fluency, Problem solving
CCT L N

Ordered pairs are used to locate position on a number plane.
The order of the numbers is very important.
The **first number** is the reading on the **x-axis**.
The **second number** is the reading on the **y-axis**.
The number plane shows 3 points:
A (2,4) B (5,3) C (7,2)
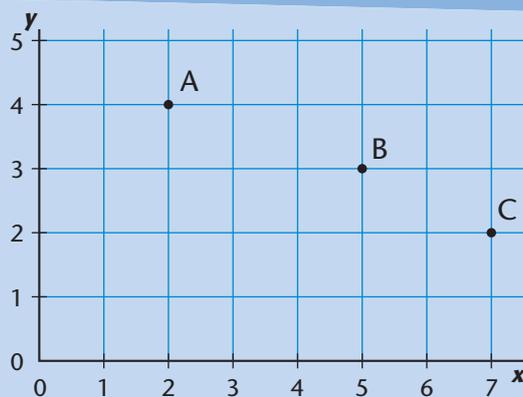
5 Plot the points on the graphs then connect them to make some polygons.

a
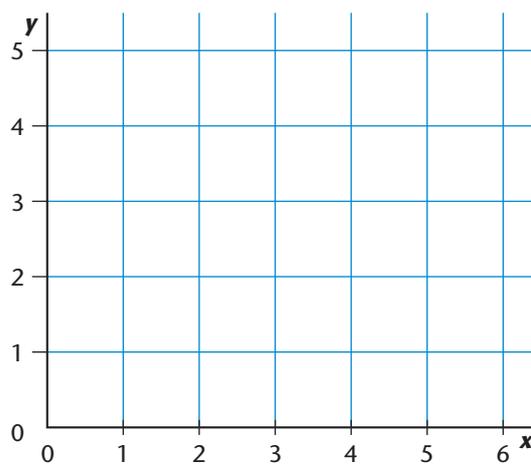
(2, 5)
(1, 4)
(1, 2)
(2, 1)
(4, 1)
(5, 2)
(5, 4)
(4, 5)

b
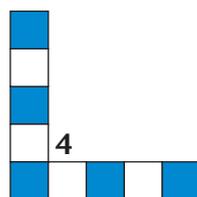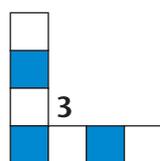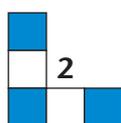
(4, 5)
(2, 5)
(1, 3)
(2, 1)
(4, 1)
(5, 3)
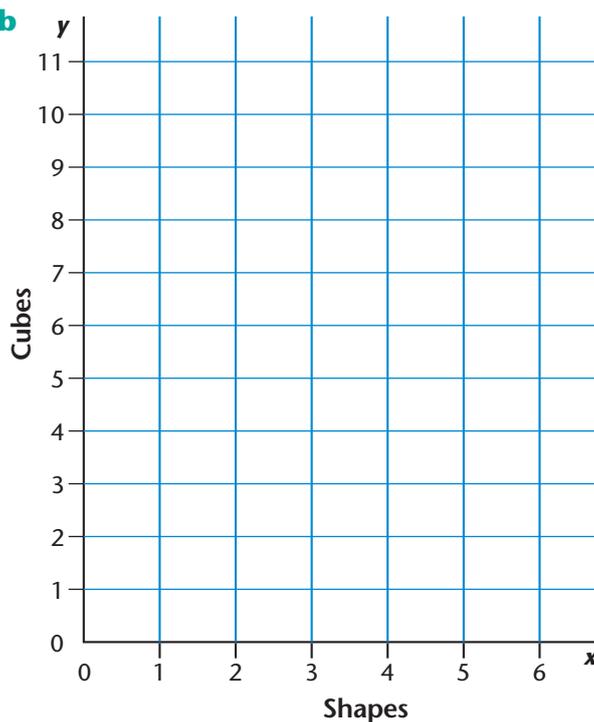
6 Dane has made a series of L shapes using cubes and has recorded their area in a table. Complete the table and plot the first five ordered pairs on the graph in part b.

a

Shapes	1	2	3	4	5
Cubes	3	5	7		

b

Cubes (y-axis)

Shapes (x-axis)

7 How many cubes would Dane need for his 9th shape?

Multiplication of decimals

Ones	Tenths
	1
2 .	3
×	4
9 .	2

Step 1: Multiply 3 tenths by 4 which equals 12 tenths.

Step 2: 12 tenths is equal to 1 and 2 tenths. Record the 1 in the ones column and record the 2 tenths in the tenths column.

Step 3: Multiply 2 ones by 4 which gives 8, then add the 1 to give 9. Record the 9 in the ones column.

I estimated the answer to be about 8 because 4 × 2 = 8.

8 Complete these multiplications.

a   3 . 4 kg
×   4

b   4 . 5 m
×   5

c   4 . 6 kg
×   4

d   5 . 2 m
×   5

e   3 . 6 kg
×   6

f   6 . 2 3 m
×   3

g   7 . 1 8 kg
×   4

h   8 . 2 1 m
×   5

i   7 . 4 3 kg
×   3

j   5 . 2 4 m
×   6

k   4 5 . 5 kg
×   3

l   3 6 . 7 m
×   4

m   4 8 . 3 kg
×   6

n   2 9 . 2 m
×   2

o   3 1 . 7 kg
×   5

p 2 5 . 2 3 m
×   6

q 2 1 . 2 9 kg
×   5

r 3 1 . 8 2 m
×   6

s 7 4 . 2 3 kg
×   7

t 1 3 . 7 5 m
×   9

$3.10 $7.90 $2.99 $12.05 $44.85

9 Before you calculate the actual cost of these purchases, round each price to the nearest dollar in order to give an approximate price.

a 7 scissors

Est: $

b 5 calculators

Est: $

c 6 staplers

Est: $

d 9 texta sets

Est: $

e 4 sunglasses

Est: $

Multiply decimals by whole numbers and perform divisions by non-zero whole numbers where the results are terminating decimals, with and without digital technologies

Understanding, Fluency
N CCT PSC

BUS ROUTE 007 — Railway St to Town Square

MONDAY TO FRIDAY

Railway St	Campbell St	Enmore Rd	Carillon Ave	Harris St	Town Square
Morning					
	06:30	6:35	6:38	6:45	7:00
	07:00	7:05	7:08	7:15	7:30
	07:10	7:15	7:18	7:25	7:45
	07:30	7:35	7:38	7:45	8:00
		7:50	7:53	8:00	8:20
	07:55		8:05	8:10	8:30
		8:15	8:20	8:30	8:50
	08:20		8:30	8:35	8:55
	08:30	8:35	8:40	8:45	9:00
09:00	09:02	9:07	9:10	9:17	9:35
09:45	09:47	9:52	9:55	10:02	10:20
10:30	10:32	10:37	10:40	10:47	11:05
11:15	11:17	11:22	11:25	11:32	11:50
Afternoon					
12:00	12:02	12:07	12:10	12:17	12:35
12:45	12:47	12:52	12:55	1:02	1:20
01:30	01:32	1:37	1:40	1:47	2:05
02:15	02:17	2:22	2:25	2:32	2:50
03:00	03:02	3:07	3:10	3:17	3:35
		3:30	3:35	3:40	4:00
03:25	03:27	3:32	3:37	3:42	4:00
	04:05	4:10	4:15	4:25	4:45
	04:30	4:35	4:40	4:50	5:10
	05:00	5:05	5:10	5:20	5:40
	05:30	5:35	5:40	5:50	6:10
	06:00	6:03	6:08	6:15	6:35
	06:30	6:33	6:38	6:45	7:00
	07:00	7:03	7:08	7:15	7:30
	07:30	7:33	7:38	7:43	8:00

SATURDAY

Railway St	Campbell St	Enmore Rd	Carillon Ave	Harris St	Town Square
Morning					
	07:30	7:33	7:38	7:45	8:00
	08:30	8:33	8:38	8:45	9:00
09:40	09:42	9:45	9:50	9:57	10:15
10:50	10:52	10:55	11:00	11:07	11:25
Afternoon					
12:05	12:07	12:10	12:15	12:22	12:40
01:20	01:22	1:25	1:30	1:37	1:55
02:35	02:37	2:40	2:45	2:52	3:10
03:50	03:52	3:55	4:00	4:07	4:25
	05:05	5:08	5:13	5:18	5:35
	06:20	6:23	6:28	6:33	6:50
	07:30	7:33	7:38	7:43	8:00
	08:45	8:48	8:53	8:58	9:15
	10:15	10:18	10:23	10:28	10:45

Bus fares (one way)

Stops	Fares
1	$1.00
2	$1.50
3	$1.90
4	$2.20
5	$2.50
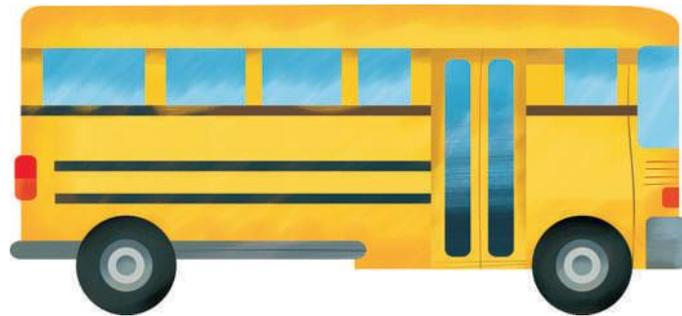
10 Answer the questions.

a What bus would Fred need to catch on Wednesday from Railway St to be at Harris St by 10:47 am?

b What bus would Sally need to catch on Friday from Campbell St to be at Town Square by 1:20 pm?

c On Monday, Alisha had to be at Carillon Ave by 10:40 am. If she caught the 11:17 am bus from Campbell St how late would she be?

d Bill wanted to be at Town Square by 6:50 pm on Saturday. What bus would he need to catch from Campbell St?

e Tom caught the 10:52 am bus from Campbell St on Saturday. Would he be at Harris St by 11:05 am?

11 Solve the problems.

a Jessica travelled from Campbell St to Carillon Ave. How much change would she get if she paid for her fare with a $50 note?

b Harry, James and Peter got on the bus at Railway St and got off at Town Square. Harry paid for all their fares with a $20 note. How much change did he get?

c Larissa makes 10 trips from Railway St to Town Square each week. Because she does so many trips, she buys a weekly ticket that costs 20% less than the daily rate. How much does Larissa's weekly ticket cost?

Multiplication is commutative

1 Complete these operations on a calculator to check whether numbers can be multiplied in any order and still produce the same product. Be careful—not all pairs are the same.

a $432 \times 25 =$ _____ $25 \times 432 =$ _____   f $741 \times 46 =$ _____ $46 \times 741 =$ _____

b $173 \times 26 =$ _____ $26 \times 173 =$ _____   g $631 \times 38 =$ _____ $38 \times 631 =$ _____

c $247 \times 18 =$ _____ $18 \times 742 =$ _____   h $452 \times 74 =$ _____ $74 \times 254 =$ _____

d $416 \times 54 =$ _____ $54 \times 416 =$ _____   i $602 \times 13 =$ _____ $31 \times 602 =$ _____

e $510 \times 29 =$ _____ $92 \times 510 =$ _____   j $528 \times 81 =$ _____ $18 \times 528 =$ _____

2 Is division commutative?
Examine the two strategies used to solve this problem and explain which one you agree with.

Problem: 72 children to be divided into 4 equal teams.
Strategy 1: $4 \div 72 =$ _____   **Strategy 2:** $72 \div 4 =$ _____

_____

_____

3 Change the order of these numbers so that it is easier to do them mentally. The first one has been done for you.

25 x 4 = 100
16 x 100 = 1600

a $25 \times 16 \times 4$ becomes $25 \times 4 \times 16 = 1600$

b $20 \times 18 \times 5$ becomes   _____

c $2 \times 10 \times 13$ becomes   _____

d $50 \times 43 \times 2$ becomes   _____

e $4 \times 38 \times 5$ becomes   _____

4 Solve these problems and explain the strategies you are going to use to solve them.

a | Tim has just finished painting his flat and is working out how much it cost him. He painted 4 rooms using 3 litres of paint per room and paid $5 per litre. How much did it cost?
My strategy: _____
_____

b | Mrs Branson placed two separate orders on different days for pizzas so that the girls' netball team and the boys' soccer team could celebrate the end of the season. On each occasion she ordered 6 pizzas at $4.50 each. What was the total amount she paid for the pizzas?
My strategy: _____
_____

c | Crazy Jack owns 4 shops and ordered 6 video cameras for each shop at a cost of $250 each. How much did this cost him?
My strategy: _____
_____

Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers

Problem solving, Reasoning
CCT N

Bree and Kyra both spent $20 000 on the same new car but they chose different options packs.

NEW CAR $16 600 DRIVE-AWAY

Options Pack
- Automatic $2190
- CD player $605
- Air-conditioning $1400
- Tinted windows $605
- Power steering $2000

5 In the table below show two different ways the women could have bought cars with various options so that they each spent $20 000.

	Base Price	Automatic	CD player	Air-conditioning	Tinted windows	Power steering	Total
Bree	$16 600						$20 000
Kyra	$16 600						$20 000

6 Solve these problems based on the purchase of new cars.

a How much would it cost Bree to buy the car with every option?

b Tom bought a car priced at $20 000 but was given a 10% discount. How much did he save?

c When Sally went to buy a car priced at $20 000 she was given $\frac{1}{5}$ off the price. How much did she save?

d How much would I save if I was given $\frac{1}{10}$ off the price of the $16 600 car?

e How much would you pay for a $16 000 car if you were given $\frac{1}{4}$ off?

f What percentage of the total price of $20 000 does the power steering represent?

g Lisa bought a used car priced at $10 000 but was given a discount of 25%. How much did she save?

h Kyra had to pay another $3958.34 insurance and registration fees. How much did the car actually cost her?

7 When Mr Johnson went to buy a car he spoke to two different sales people. One offered him a discount of 25% and the other offered him $\frac{1}{5}$ off the price. Explain which discount is larger.

8 Carly receives 10% commission on the sale of every car she sells. How much did she earn last month if she sold four cars worth a total of $200 000?

Roman numerals

Roman numerals

The number system we use is called Hindu-Arabic.
On occasions we also use Roman numerals.

1 I	6 VI	20 XX	70 LXX	
2 II	7 VII	30 XXX	80 LXXX	
3 III	8 VIII	40 XL	90 XC	
4 IV	9 IX	50 L	100 C	
5 V	10 X	60 LX	500 D	
			1 000 M	

My father is LVII years old.

9 Use the grid above to assist you in providing Roman numerals for each number.
You will need to combine Roman numerals for thousands, hundreds, tens and ones.
(e.g. 367 = CCC + LX + VII = CCCLXVII. You may not group more than 3 of the
same Roman numerals together (e.g. 40 is written as XL, not as XXXX).

a 18 _____XVIII_____

b 39 _____

c 46 _____

d 58 _____

e 47 _____

f 96 _____

g 99 _____

h 127 _____

i 136 _____

j 263 _____

k 346 _____

l 584 _____

m 654 _____

n 661 _____

o 725 _____

p 1125 _____

q 1326 _____

r 2181 _____

10 Write Roman numerals for the heights and year of construction of each building.

	Building/construction	Height	Year
a	Leaning Tower of Pisa	55 m = LV	1350 = MCCCL
b	Taj Mahal	76 m =	1631 =
c	Statue of Liberty	93 m =	1884 =
d	Big Ben	96 m =	1870 =
e	Eiffel Tower	300 m =	1889 =
f	Sydney Harbour Bridge	135 m =	1932 =
g	Sydney Opera House	68 m =	1973 =
h	CN Tower Toronto	555 m =	1975 =

Eiffel Tower 1889

11 Write the answers to these additions and subtractions in Roman numerals.

a	LXXXV plus XXXVIII	
b	XLVIII minus XXIX	
c	LXXXVIII plus CXVII	

d	CCXIV plus CXXV	
e	DCLX plus CCXXVII	
f	DCC minus CCLXVII	

84 Select and apply efficient mental and written strategies and appropriate digital
technologies to solve problems involving all four operations with whole numbers

Understanding
N L

The Walters family is leaving soon on a world trip. They need to know what clothes to take, so they are looking very carefully at the temperatures of the cities they will visit.

Cities of the world

■ minimum temperature

■ maximum temperature
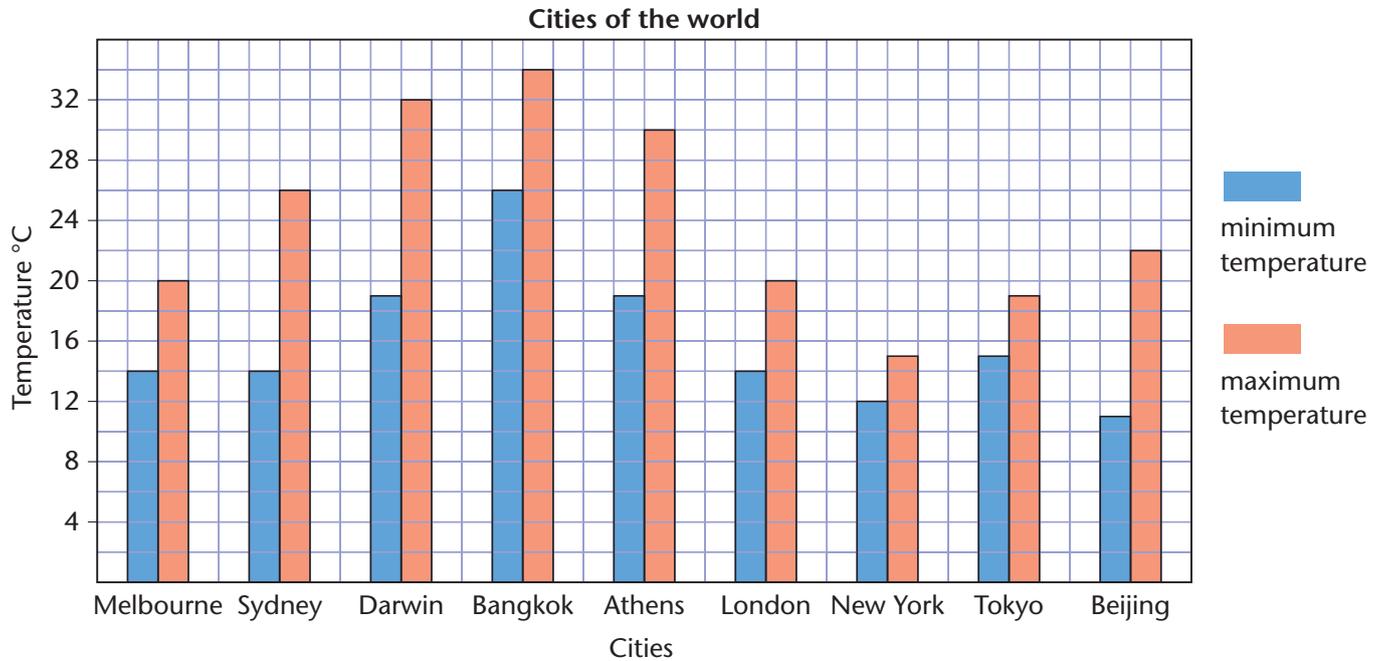
12 Answer these questions.

a Which city has the highest maximum temperature? _____

b Which city has the lowest maximum temperature? _____

c Which city has the highest minimum temperature? _____

d Which city has the lowest minimum temperature? _____

e How many degrees hotter is Bangkok than Athens? _____

f How many degrees hotter is Athens than New York? _____

g Which city has the greatest difference in minimum and maximum temperatures? _____

h Which city has the smallest difference in minimum and maximum temperatures? _____

13 What is the difference between the minimum and maximum temperatures of these cities?

a Sydney _____   **c** Bangkok _____   **e** London _____

b Melbourne _____   **d** Athens _____   **f** Beijing _____

14 What is the average maximum temperature of Melbourne, Sydney and Darwin? _____

15 Which minimum temperature appears most often? _____

16 Which maximum temperature appears most often? _____

Extended multiplication

1 Complete these extended multiplications.

Why does the 2nd line of each algorithm always have zero in the ones column?

_____

a
```
      4
    5 8
×   1 5
  2 9 0
    1
  5 8 0
  8 7 0
```

b
```
  4 8 4
×   2 6
```

c
```
  6 2 6
×   4 7
```

d
```
  2 8 8
×   2 8
```

e
```
  1 4 5
×   3 2
```

f
```
  3 5 2
×   1 2
```

g
```
  2 4 3
×   3 6
```

h
```
  4 3 7
×   8 5
```

i
```
  5 6 4
×   8 7
```

j
```
  6 7 8
×   7 9
```

k
```
  2 5 6
×   3 6
```

l
```
  3 5 9
×   1 7
```

m
```
  2 7 4
×   2 8
```

n
```
  1 3 5
×   3 9
```

o
```
  2 6 7
×   4 9
```

2 Solve the problem.

Mrs Hassan bought 7 digital television sets to sell in her shop. If she paid $789 each for them and sold them for $1000 each, how much profit did she make?

3 Solve the number cross. You may need a calculator.

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

Across

1 $16 \times 24 =$ _____

3 $36 \times 41 =$ _____

5 $9 \times 12 =$ _____

6 $53 \times 13 =$ _____

8 $15^2 =$ _____

10 $14^2 =$ _____

12 $123 \times 8 =$ _____

13 $7 \times 9 =$ _____

Down

2 $16 \times 28 =$ _____

4 $27^2 =$ _____

5 $75 \times 15 =$ _____

7 $79 \times 11 =$ _____

9 $6 \times 99 =$ _____

10 $12^2 =$ _____

11 $6 \times 11 =$ _____

14 $12 \times 3 =$ _____

Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers

Problem solving
N CCT

Equivalent fractions can be made using overlays of congruent shapes. The example below shows a clear plastic overlay and a model of the fraction $\frac{2}{3}$. When the overlay is put on top of the model $\frac{2}{3}$ becomes $\frac{4}{6}$.

Overlay

Model $\frac{2}{3}$

Model of $\frac{2}{3}$ with overlay on top
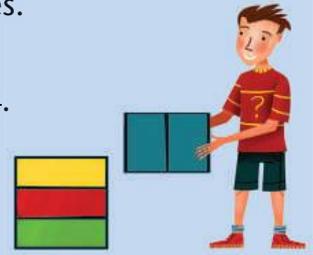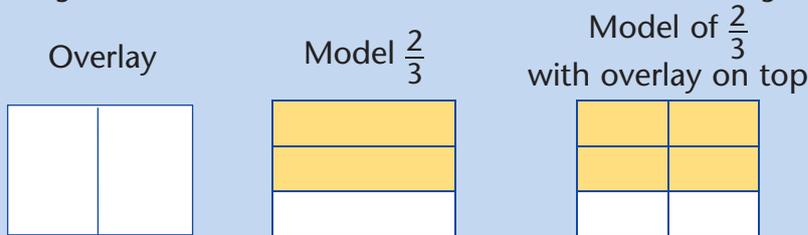
$\frac{2}{3} = \frac{4}{6}$

4 Draw and record the fraction formed when the overlay is placed over the model.

Overlay | Model | Equivalent fraction

$\frac{1}{4} = \frac{2}{8}$

a

$\frac{1}{4}$

b

$\frac{3}{5}$
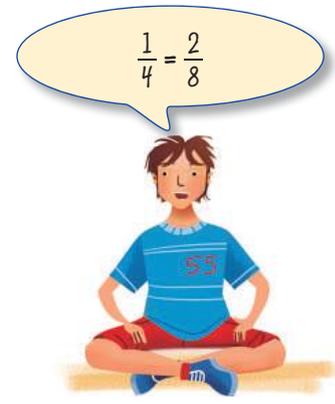
We can make **equivalent fractions** by multiplying both the numerator and the denominator by the same number.

E.g. $\frac{2}{5} \times \frac{2}{2} = \frac{4}{10}$

5 Make equivalent fractions for the ones given. The first one has been done for you.

a $\frac{1}{4} \times \frac{5}{5} = \frac{5}{20}$

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

c $\frac{1}{10} \times \frac{4}{4} =$

d $\frac{1}{6} \times \frac{2}{2} =$

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

f $\frac{2}{5} \times \frac{4}{4} =$

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

h $\frac{3}{10} \times \frac{5}{5} =$

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

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

k $\frac{6}{10} \times \frac{10}{10} =$

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

$\frac{7}{10} \times \frac{10}{10} = \frac{70}{100}$

6 Continue the equivalent fraction patterns.

a $\frac{1}{2} = \frac{2}{4} = \frac{\square}{6} = \frac{\square}{8} = \frac{\square}{10} = \frac{\square}{12}$

b $\frac{1}{3} = \frac{2}{6} = \frac{\square}{9} = \frac{\square}{12} = \frac{\square}{15} = \frac{\square}{18}$

c $\frac{1}{4} = \frac{2}{8} = \frac{\square}{12} = \frac{\square}{16} = \frac{\square}{20} = \frac{\square}{24}$

d $\frac{1}{5} = \frac{2}{10} = \frac{\square}{15} = \frac{\square}{20} = \frac{\square}{25} = \frac{\square}{30}$
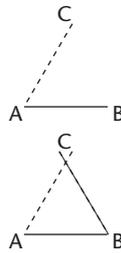
7 Answer true or false.

a $\frac{1}{5} = \frac{2}{10}$ _____

b $\frac{1}{4} = \frac{2}{8}$ _____

c $\frac{1}{5} = \frac{3}{15}$ _____

d $\frac{2}{3} = \frac{6}{9}$ _____

e $\frac{3}{4} = \frac{8}{12}$ _____

f $\frac{3}{5} = \frac{10}{15}$ _____

g $\frac{3}{5} = \frac{12}{20}$ _____

h $\frac{5}{8} = \frac{25}{40}$ _____

Constructing and describing triangles

8 Equilateral triangle

a Use a protractor to construct an angle of 60° at A leading towards C. Make the line at least 95 mm long.

b Construct an angle of 60° at B leading towards C. Make the line at least 95 mm long.

c Firm in your triangle. Fill in the gaps in the sentences opposite.

d What is the size of ∠ACB? _____

Equilateral triangles have ⬚ angles the same size and ⬚ sides the same length. They also have ⬚ lines of symmetry.
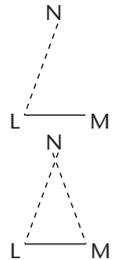
Isosceles triangles have ⬚ sides the same length and ⬚ angles the same size. They have only ⬚ line of symmetry.

9 Isosceles triangle

a Construct an angle of 70° at L leading towards N. Make the line at least 9.5 cm long.

b Construct another angle at M of 70° leading towards N. Make the line at least 9.5 cm long.

c Firm in your triangle. Fill in the gaps in the sentences opposite.

d What is the size of ∠LNM?_____

10 Scalene triangle

a Construct an angle of 70° at Y leading towards X. Make the line at least 75 mm long.

b Construct another angle of 45° at Z leading towards X. Make the line at least 10 cm long.

c Firm in the triangle. Fill in the gaps in the sentences opposite.

d What is the size of ∠YXZ? _____
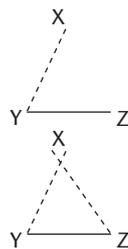
Scalene triangles have ⬚ angles the same and ⬚ sides the same length. They also have ⬚ lines of symmetry.

88 Investigate, with and without digital technologies, angles on a straight line, angles at a point and vertically opposite angles. Use results to find unknown angles

Problem solving, Reasoning
L CCT
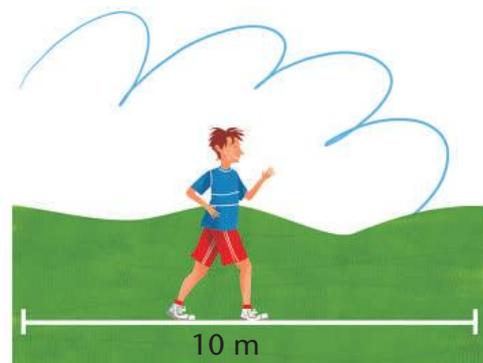
11 Find a suitable place in the playground and mark off a 10-m line.
Count how many of your paces are needed to cover 10 m. _____ paces

Use this information to estimate these lengths before measuring them.

	Length	Estimate	Metres
a	The width of a netball court		
b	The length of a netball court		
c	The width of a school building		
d	The length of a school building		
e	The width of the playground		

10 m

Measurement facts
10 millimetres = 1 centimetre   1000 millimetres = 1 metre
100 centimetres = 1 metre   1000 metres = 1 kilometre

12 Use your measurement facts to convert these measurements to different units.

a 6 cm = _____ mm

b 8 m = _____ cm

c 5 km = _____ m

d 18 cm = _____ mm

e 55 m = _____ cm

f 11 km = _____ m

g $5\frac{1}{2}$ cm = _____ mm

h 2.5 m = _____ cm

i 9.5 km = _____ m

j 11.5 cm = _____ mm

k 4.25 m = _____ cm

l 8.3 km = _____ m

m 60 mm = _____ cm

n 500 cm = _____ m

o 4000 m = _____ km

p 1000 mm = _____ m

q 4500 mm = _____ m

r 9250 m = _____ km

13 Order these units of length from shortest to longest.

a	19 cm	9 m	250 mm	20 cm	
b	3 m	290 cm	3.1 m	2950 mm	
c	4000 mm	401 cm	3.5 m	4000 cm	

14 Solve these comparison problems.

a	What would be the perimeter of a square if its area was 25 cm^2?	
b	A rectangle has a length of 9 cm and a perimeter of 26 cm. What would be its width?	
c	A rectangle is twice as long as it is wide. What is its perimeter if its area is 32 cm^2?	

1 Circle the estimate you think is the most accurate for each division then do the divisions to find the exact answer. Tick the last box if your exact answer was close to your estimate.

Question	Estimated answer				Close
a $3\overline{)18969}$	60	600	6000	60000	
b $4\overline{)12848}$	3	30	300	3000	
c $5\overline{)75255}$	15000	1500	150	15	
d $6\overline{)38748}$	60	600	6000	60000	
e $4\overline{)82480}$	20000	2000	200	20	

18968 ÷ 3?
Think 18 thousand ÷ 3.
That's 6 thousand.

2 Solve these problems using any strategy you wish.

a	How many Queensland scouts were at the camp if $\frac{1}{4}$ of the 1700 scouts were Queenslanders?	
b	3600 mL of water leaked from the pipe over 8 hours. How many millilitres escaped each hour?	
c	At swimming training Paul usually swims 60 laps. How many laps of freestyle does he do if $\frac{1}{3}$ of the laps he does are freestyle?	
d	It took Jo 6 years to save $6564. What was her average amount of savings per year?	

3 Crack the secret code by substituting the division answers for the letters and writing them in the numbered grid below. You may use your calculator.

R	I	X	G	L	V	O	M	N	D	I	P
906	377	104	2450	903	8356	288	107	554	873	567	281

1 $3\overline{)864}$ **2** $3\overline{)1701}$ **3** $2\overline{)1134}$ **4** $5\overline{)1440}$

5 $5\overline{)2835}$ **6** $8\overline{)4432}$ **7** $3\overline{)2619}$ **8** $9\overline{)7857}$

9 $7\overline{)58492}$ **10** $8\overline{)19600}$ **11** $6\overline{)14700}$ **12** $4\overline{)3492}$

Secret words

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

90 Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers

Problem solving, Understanding
CCT N

Finding percentages
A simple way to find a percentage of an amount is to think of it as a fraction.
For example 10% of $20 can be looked upon as $\frac{1}{10}$ of $20 which equals $2.

4 Draw a line to match each percentage with a fraction of the same value.

| 10% | 25% | 50% | 20% |

| $\frac{1}{4}$ | $\frac{1}{10}$ | $\frac{1}{5}$ | $\frac{1}{2}$ |

$40 — 10% off
$50 — 50% off
$20 — 25% off
$100 — 10% off
$60 — 20% off

5 Calculate the discount offered on each item.

a Shirt $ _____ b Jacket $ _____ c Shorts $ _____ d Skirt $ _____ e Cap $ _____

6 During the netball tournament the following data was recorded. Calculate the number of goals each girl scored. The first one has been done for you.

Girl	Attempts	Success rate	Goals
a Sam	20	25%	5
b Julia	60	50%	
c Lara	50	10%	
d Kim	20	100%	
e Susie	40	25%	

Girl	Attempts	Success rate	Goals
f Tanya	30	10%	
g Zoe	60	25%	
h Trung	80	20%	
i Lauren	40	20%	
j Zena	90	10%	

7 Answer the questions.

a Who scored the most goals? _____

b Who scored the least goals? _____

c How many goals do you think Lara would score if she had 100 shots? _____

8 How many percentages of $200 can you find? Write as many as you can with the answers in the space opposite.

$200

9 Making a pattern of hexagons
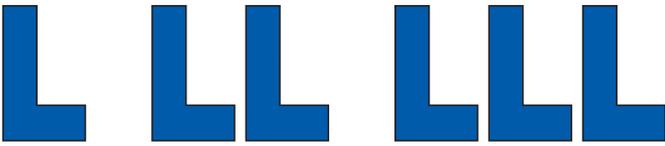
a Complete and extend the table to record the number of sides needed to make the pattern of hexagons.

Hexagons	1	2	3	4	5	6	7
Sides							

b Write a rule to describe the pattern.

c How many sides would there be on 9 hexagons?

10 Making a pattern of octagons
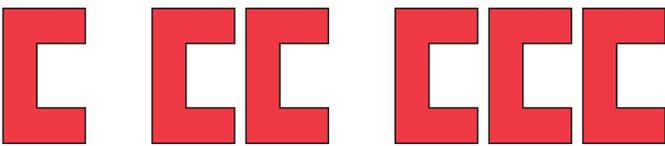
a Complete and extend the table to record the number of sides needed to make the pattern of octagons.

Octagons	1	2	3	4	5	6	7
Sides							

b Write a rule to describe the pattern.

c How many sides would there be on 11 octagons?

11 Making a pattern of decagons
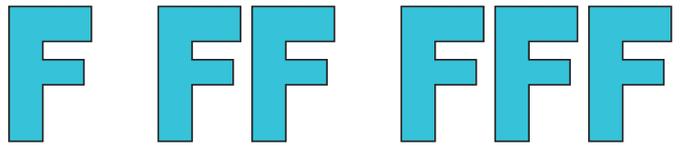
a Complete and extend the table to record the number of sides needed to make the pattern of decagons.

Decagons	1	2	3	4	5	6	7
Sides							

b Write a rule to describe the pattern.

c How many sides would there be on 15 decagons?

12 Making a pattern of dodecagons

a Complete and extend the table to record the number of sides needed to make the pattern of dodecagons.

Dodecagons	1	2	3	4	5	6	7
Sides							

b Write a rule to describe the pattern.

c How many sides would there be on 10 dodecagons?

13 Make up a table of your own based on any shape below.

Shape	1	2	3	4	5	6	7
Sides							
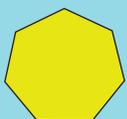
heptagon   pentagon   nonagon

Continue and create sequences involving whole numbers, fractions and decimals. Describe the rule used to create the sequence

Understanding, Problem solving
L N
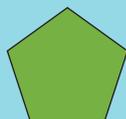
Perimeter is the distance around the boundary of a shape.

14 Measure the perimeter of these shapes in millimetres.

a
p =   mm

b
p =   mm

c
p =   mm

d
p =   mm
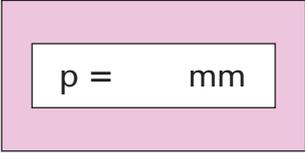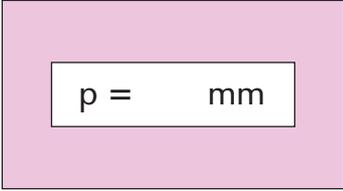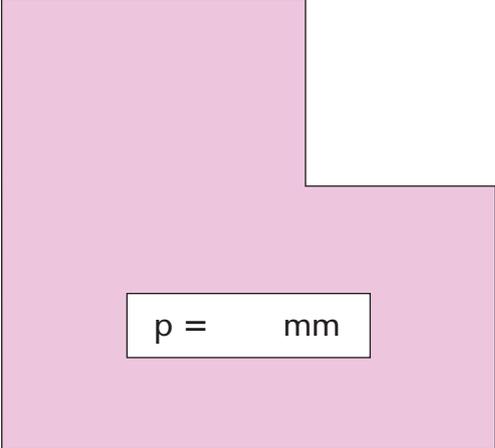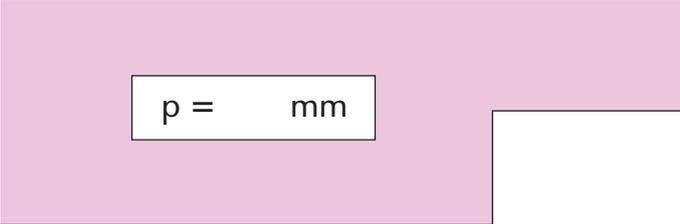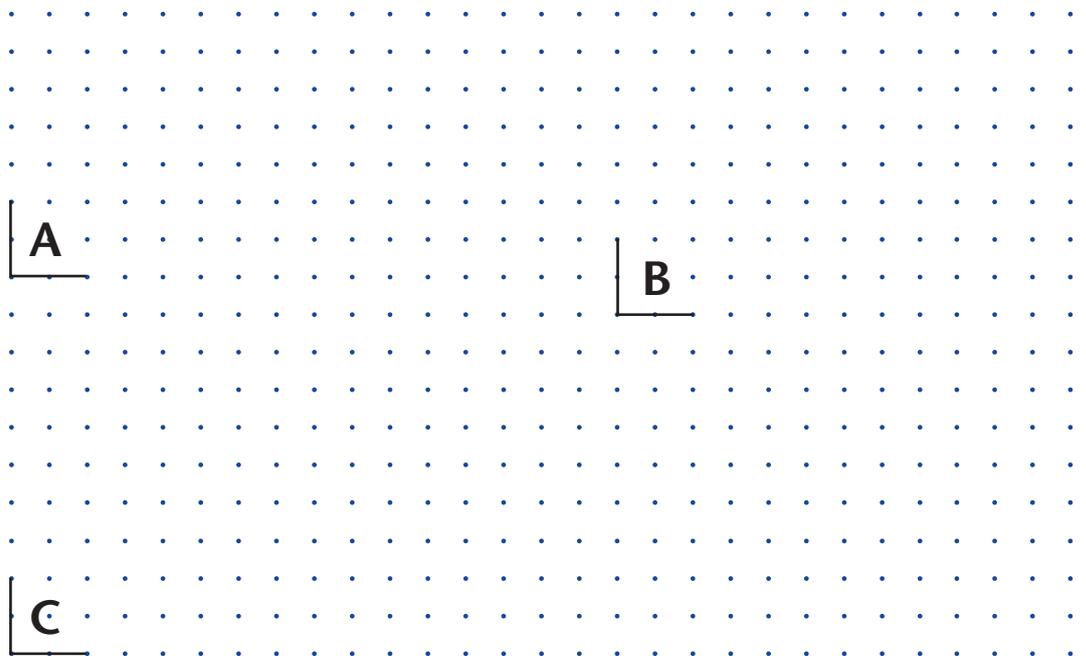
15 Draw three rectangles named A, B and C with the following perimeters and areas. One dimension on your perimeters may be in half centimetres (5 mm). A starting point has been provided for the three rectangles.

A
Per = 18 cm
Area = 18 cm²

B
Per = 19 cm
Area = 22 cm²

C
Per = 31 cm
Area = 46 cm²

A

B

C

16 Lee was wondering whether all shapes that have the same perimeter have the same area.
Complete the chart to see whether these rectangles, which all have a perimeter of 16 cm, have the same area.

	Dimensions			
	Length	Width	Perimeter	Area
a	7 cm	1 cm	16 cm	
b	6 cm	2 cm		
c	5 cm	3 cm		
d	4 cm	4 cm		16 cm²

17 True or False?
Squares have a greater area than rectangles with the same perimeter. _____

Multiplying by tens

1 Complete this chart which involves multiplication by 10, 100 and 1000.

×	10	100	1000		×	10	100	1000
a 8	80	800	8000	**g** 50			
b 18				**h** 100			
c 25				**i** 77			
d 39				**j** 194			
e 10				**k** 137		13 700	
f 40			40 000	**l** 235			

Multiplying by ten

$$\begin{array}{r} \overset{1}{} \overset{2}{} \\ 2\ 4\ 5 \\ \times \quad\ 4\ 0 \\ \hline 9\ 8\ 0\ 0 \end{array}$$

Step 1: Record 0 because you are multiplying by a ten.
Step 2: Multiply by 4 using the shortened method.

Always put the 0 down first.

2 Complete the multiplications.

a	1 2 6	b	2 3 4	c	3 5 6	d	1 3 5	e	2 3 7
	× 3 0		× 5 0		× 4 0		× 6 0		× 4 0

f	1 3 5	g	2 5 7	h	2 6 4	i	6 2 3	j	7 4 5
	× 9 0		× 5 0		× 6 0		× 7 0		× 8 0

k	1 3 5 7	l	1 3 5 9	m	2 6 4 9	n	2 7 2 8	o	3 3 8 5
	× 9 0		× 6 0		× 5 0		× 4 0		× 3 0

3 Estimate an answer to the problems by rounding each large number to the nearest 100 or 1000 before multiplying them.

a The jeweller bought 20 watches at $398 each. Approximately how much did he spend? _____

b On average there are 411 pupils at each of 30 schools. Approximately how many students are there altogether? _____

c The car yard bought 40 cars at an average price of $7993. What was the approximate amount of money spent? _____

Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers

Reasoning, Problem solving
N CCT

4 Using the memory

Jason bought 3 pens, 2 calculators and 4 pairs of scissors.

Step 1. Enter $1.65 × 3 then M+

Step 2. Enter $6.80 × 2 then M+

Step 3. Enter $2.55 × 4 then M+

Step 4. Press MR to get the total
of $28.75

CALCULEX

96147521.

$1.65

$2.55

$2.15

$6.80

$1.85

5 Use the memory function to calculate the totals of the following items. (Remember to clear the memory after each question.)

a 2 liquid white outs and 5 glue sticks $ _____

b 8 calculators, 3 liquid papers and 6 pens $ _____

c 2 pairs of scissors, 5 liquid white outs and 7 pens $ _____

d 12 glue sticks, 12 liquid white outs and 25 pens $ _____

e 40 pens, 20 scissors, 9 glue sticks and 8 calculators $ _____

6 Write and solve a question that uses the memory function.

7 Use the memory function on your calculator to solve the equations. You will need to use the M− on some questions.

a $(37 + 64) + (18 × 23) + (37 − 19) =$ _____

b $(35 + 18) + (37 − 16) + (18 × 5) =$ _____

c $(5 × 19) + (36 ÷ 9) + (40 × 7) =$ _____

d $(100 − 57) − (80 ÷ 16) =$ _____

e $87 + (195 − 89) − (35 × 3) =$ _____

f $(137 × 9) + (99 − 87) − (36 × 3) =$ _____

8 Write equations using brackets and solve them using the memory function on the calculator.

Shopping problems

Steak	Turkey	Mushrooms	Potatoes	Oranges
$8.40 kg	$16.40 kg	$5.50 kg	$2.40 kg	$2.50 kg
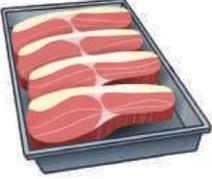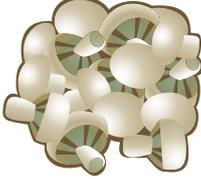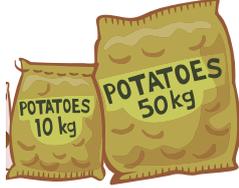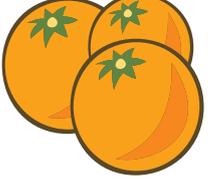
9 Find out how much each person spent.

a Tom bought 3 kg of steak and a 2-kg turkey. $ _____

b Jan bought $3\frac{1}{2}$ kg of mushrooms and 5 kg of potatoes. $ _____

c Ebony bought a 1.75-kg turkey and 1.5 kg of oranges. $ _____

d Caleb bought 4.9 kg of steak and 1 kg of mushrooms. $ _____

e Anna bought 7.3 kg of steak, a 3.5-kg turkey and 1.5 kg of mushrooms. $ _____

f Peni bought 2.75 kg of steak, a 2.5-kg turkey and 5 kg of potatoes. $ _____

10 Toby, Mia and Alex each went shopping. Using the prices above, complete their shopping dockets so that they match the totals on the bottom of each docket.

a

Item	Quantity	Price
Total		$18.80

b

Item	Quantity	Price
Total		$30.30

c

Item	Quantity	Price
Total		$34.80

11 Solve these problems.

a Jasmin had a budget of $89 to spend on her shopping. If she bought 6 kg of steak, 2 kg of turkey and 4 kg of oranges, by how much would she have overspent her budget?

b Angus bought 6 kg of potatoes and 10 kg of steak. If he only had $50 cash, how much did he put on his credit card?

Theo's Fruit Barn

Add and subtract decimals, with and without digital technologies, and use estimation and rounding to check the reasonableness of answers

Problem solving, Fluency
PSC CCT N

Dot plots are a type of graph in which scores are represented by dots placed along a number line.

Example:

Scores in the Quick Quiz
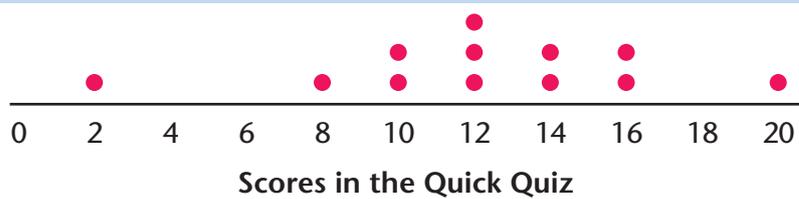
Cooper converted the price of small-sized pizzas around the world into Australian dollars on his recent trip, and recorded his data in this table.

Small pizza price	$A
United States	$3.15
Australia	$2.40
Britain	$3.65
China	$1.40
Japan	$3.40
Switzerland	$5.90
New Zealand	$2.65
Russia	$2.40
Taiwan	$2.90

Small pizza price	$A
Croatia	$3.15
Sweden	$3.65
India	$2.65
South Africa	$2.90
Iraq	$2.90
Argentina	$2.90
Cuba	$2.90
Canada	$2.40
Spain	$2.65

12 Create a dot plot to represent the prices of pizzas around the world.

Dot plot of pizza prices

140 165 190 215 240 265 290 315 340 365 390 415 440 465 490 515 540 565 590 615
Cents
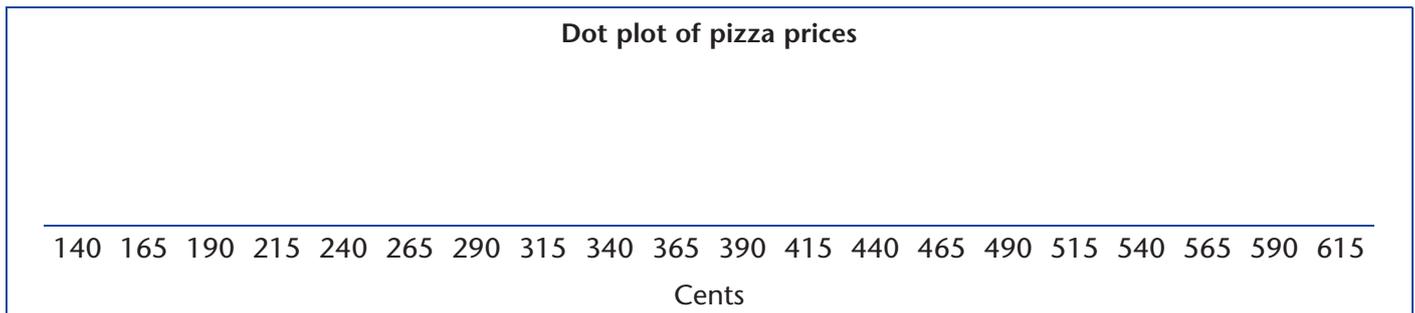
13 Answer the questions. Express your answers using $ and c.

a What was the most popular price for the small-sized pizza? _____

b How many countries charged $3.15? _____

c How many countries charged $3.40? _____

d How many countries charged $2.40? _____

e What is the difference between the most expensive and the cheapest pizza? _____

Outliers are unusually high or low scores. They lie outside the main cluster of scores.

14 Name the prices that you consider to be outliers. _____

When multiplying a decimal by a whole number there will be the same number of digits after the decimal point in the answer as in the decimal being multiplied.

1 Calculate the answers to the multiplications.

a $\begin{array}{r} 2.13\text{m} \\ \times \quad\quad 3 \\ \hline \end{array}$
b $\begin{array}{r} 7.46\text{m} \\ \times \quad\quad 3 \\ \hline \end{array}$
c $\begin{array}{r} 18.03\text{m} \\ \times \quad\quad 9 \\ \hline \end{array}$
d $\begin{array}{r} 17.96\text{m} \\ \times \quad\quad 8 \\ \hline \end{array}$
e $\begin{array}{r} 25.35\text{m} \\ \times \quad\quad 6 \\ \hline \end{array}$

f $\begin{array}{r} 13.8\text{m} \\ \times \quad\quad 5 \\ \hline \end{array}$
g $\begin{array}{r} 274.2\text{m} \\ \times \quad\quad 6 \\ \hline \end{array}$
h $\begin{array}{r} \$391.27 \\ \times \quad\quad 7 \\ \hline \end{array}$
i $\begin{array}{r} \$400.06 \\ \times \quad\quad 9 \\ \hline \end{array}$
j $\begin{array}{r} \$256.48 \\ \times \quad\quad 8 \\ \hline \end{array}$

Decimals can be rounded to the nearest whole number to give fairly accurate estimates. The greater than > and less than < symbols can also be used to make estimates even more accurate.

Example: $\boxed{2.704 \times 8}$ I'll round up to give 3 × 8 = 24
Because I rounded up, my estimate will be a bit too big.

I'll record my estimate as $\boxed{< 24}$

2 Apply rounding strategies to estimate these products. Use the greater than > and less than < symbols to make your estimate even more accurate.

	Question	Rounding process	Estimate
a	5.905 × 8		
b	7.105 × 6		
c	4.221 × 9		

	Question	Rounding process	Estimate
d	19.878 × 8		
e	30.018 × 5		
f	14.954 × 3		

3 Find the cost of these items.

a 3 boxes of chocolates _____

b 7 jars of jam _____

c 3 loaves of bread and 2 L of milk _____

d 5 colas, 3 tins of biscuits and a loaf of bread _____

e 1 jar of jam, 3 colas, 2 milks and 2 boxes of chocolates _____

f 7 loaves of bread, 7 L of milk and 3 tins of biscuits _____

$2.07 $1.10 LITRE $7.65 $3.05 $2.25 $1.95
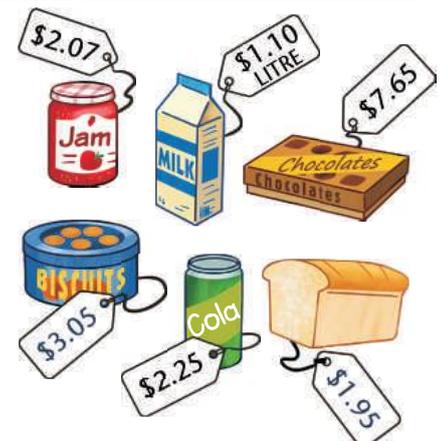
4 Sarah spent between $26 and $29 on two of the grocery items above. If she bought 7 of one item and 9 of another item, what items could she have bought?

Multiply decimals by whole numbers and perform divisions by non-zero whole numbers where the results are terminating decimals, with and without digital technologies

Fluency, Problem solving
N CCT PSC

5 Apply the rule to complete the sequences.

$$\blacksquare \times 2 + 5 = \bullet$$

a

■	1	2	3	4	5	6	7	8
●								

$$3 \times \blacksquare + 4 = \bullet$$

d

■	2	4	6	8	10	12	14	16
●								

$$\blacktriangle \times 8 + 2 = \bullet$$

b

▲	1	3	5	7	9	11	13	15
●								

$$\blacksquare \times 5 - 3 = \bullet$$

e

■	1	2	3	4	5	6	7	8
●								

$$\blacktriangle \times 2 - 10 = \blacksquare$$

c

▲	90	80	70	60	50	40	30	20
■								

$$\blacksquare \times 7 - 5 = \bullet$$

f

■								
●	2	16	30	44	58	72	86	100

6 Create number sequences using the operations, then write a rule for each.

a Multiplication and addition

▲	1	2	3	4	5	6	7
●							

Rule ▲ _____
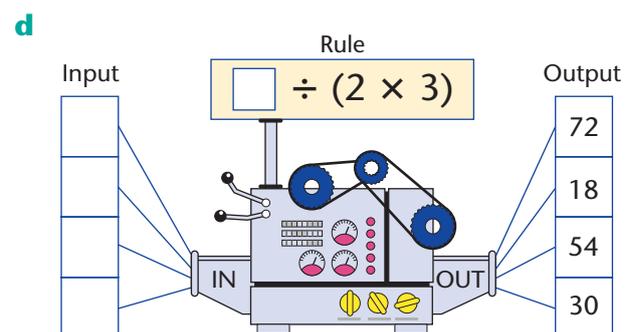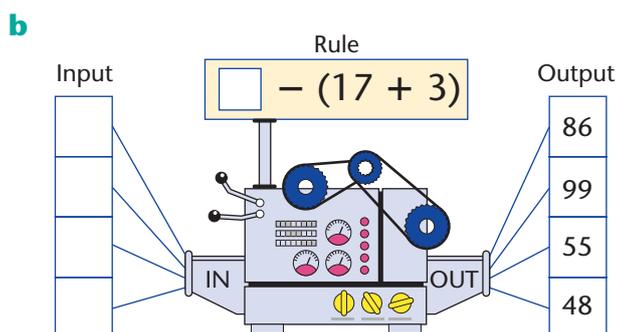
b Multiplication and subtraction

▲	1	2	3	4	5	6	7
●							

Rule ▲ _____

Backtrack to check that your numbers suit the pattern.

7 Work backwards to calculate the value of the input numbers.

a

Input | Rule $\square + 3 \times 5$ | Output

Output: 45, 72, 63, 54

c

Input | Rule $\square - 10 \div 5$ | Output

Output: 49, 58, 85, 94

b

Input | Rule $\square - (17 + 3)$ | Output

Output: 86, 99, 55, 48

d

Input | Rule $\square \div (2 \times 3)$ | Output

Output: 72, 18, 54, 30

Understanding, Problem solving
N CCT

Continue and create sequences involving whole numbers, fractions and decimals.
Describe the rule used to create the sequence

99
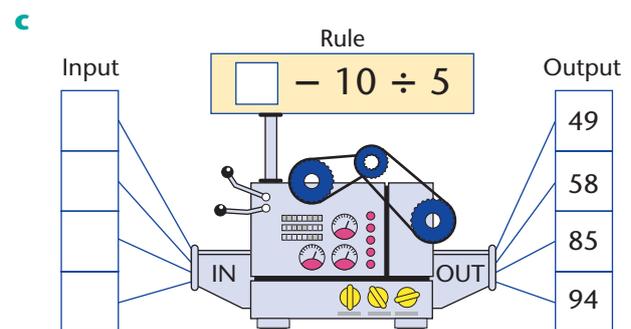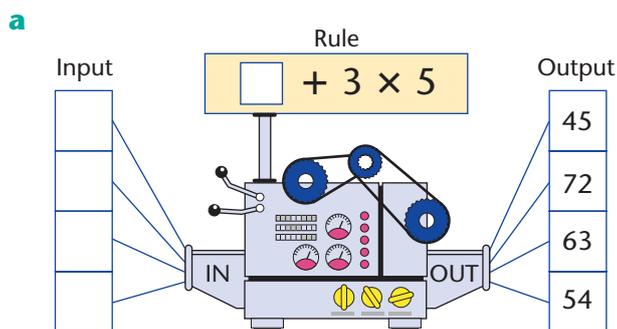
Negative numbers

There are many instances in the real world where we need negative numbers. Negative numbers are numbers **less than zero** written with a minus sign (−) in front of them. Positive numbers greater than zero are the numbers you have been dealing with so far and can be written with or without a (+) sign.

8 There are many places around the world and in Australia where temperatures below zero exist. Look carefully at the thermometers below and record the temperatures.

a °C b °C c °C d °C e °C f °C g °C
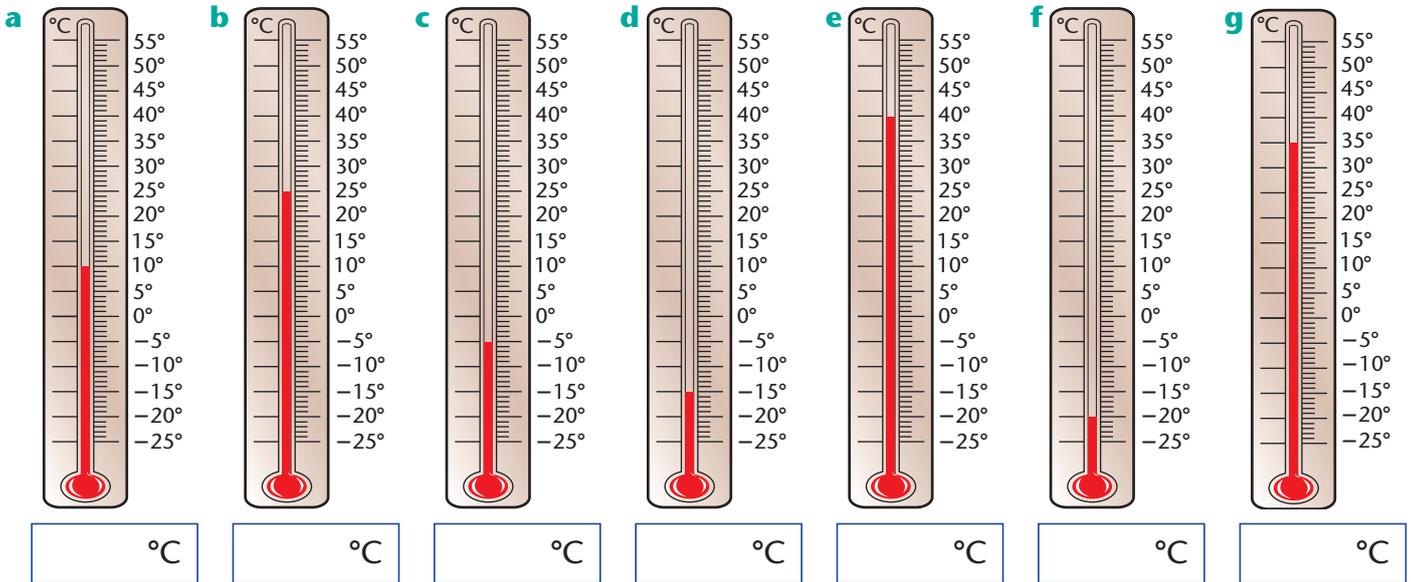
9 Look carefully at this diagram representing sea levels, then estimate an answer to each question.

a How far above sea level is the top of the flag? _____

b How far below sea level is the fish? _____

c How far above sea level is the aerial on the house? _____

d How far below sea level is the swimmer's foot? _____

e How far above sea level is the top of the house? _____

f Give the height of both birds. _____

g Give the height of the top of the wave. _____

h Give the height of the top of the fence. _____

Investigate everyday situations that use integers.
Locate and represent these numbers on a number line

Understanding, Problem solving
CCT N L
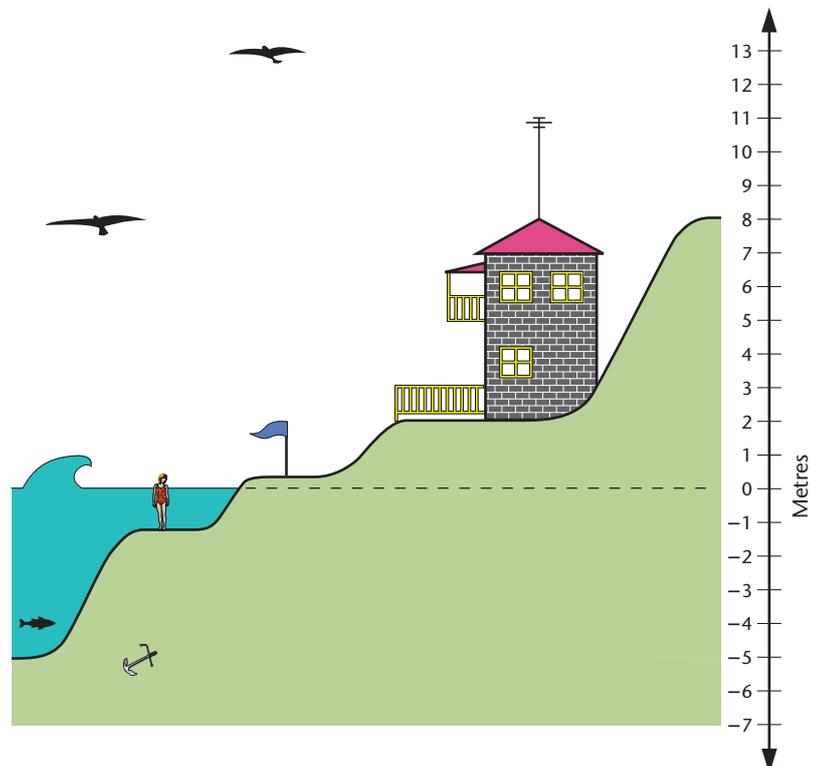
10 Calculate the work time from start to finish for these occupations.

	Occupation	Start	Finish	Elapsed time
a	Carpenter	7:00 am	4:00 pm	
b	Accountant	8:00 am	5:30 pm	
c	Part-time teller	11:00 am	2:30 pm	
d	Nurse	8:00 pm	5:00 am	
e	Security guard	9:00 pm	6:30 am	

11 The armed forces often use 24-hour time when conducting their exercises. Calculate the amount of time each person spent on these activities.

a Private Smee went on manoeuvres at 2200 and finished them at 0830. How long did the manoeuvres take? _____

Captain! Take me back please, I'm seasick again.

b Captain Zero started flying at 1600 and finished his journey at 0515. How long did the flight take? _____

c Captain Hook took the RAN *Commander* on a short cruise that started at 1105 and finished at 1345. How long did it take? _____

12 Make a timetable for a Tuesday and a Wednesday of your school week. List the times in half-hour intervals in the first column.

Time	Tuesday	Wednesday
	Recess	Recess
	Lunch	Lunch

I want more homework!

Multiplying decimals

When multiplying a decimal by a whole number, the number of numerals after the decimal point in the product must be equal to the total number of numerals after the decimal point in the multiplicand.

Example:

```
        4 . 2 5  ←  2 numbers after
                     the decimal
   ×        1 5     point
   ─────────────    (multiplicand)
        2 1   2 5
   ─────────────
      4 2   5 0
   ─────────────
      6 3 . 7 5  ←  2 numbers after
                     the decimal
                     point (product)
```

1 Multiply these decimals by whole numbers.

a metres

```
      3 . 2 8
   ×      2 3
   ──────────

   ──────────
              m
```

b kilometres

```
      4 . 3 4
   ×      2 5
   ──────────

   ──────────
            km
```

c litres

```
      5 . 2 6
   ×      6 5
   ──────────

   ──────────
             L
```

d kilometres

```
      4 . 3 8
   ×      1 7
   ──────────

   ──────────
            km
```

e metres

```
      6 . 4 5
   ×      3 2
   ──────────

   ──────────
              m
```

f kilograms

```
      9 . 4 7
   ×      4 3
   ──────────

   ──────────
            kg
```

g metres

```
      8 . 4 2
   ×      2 4
   ──────────

   ──────────
             m
```

h kilometres

```
      2 . 5 8
   ×      2 8
   ──────────

   ──────────
            km
```

i litres

```
      7 . 6 5
   ×      4 1
   ──────────

   ──────────
             L
```

Remember! Keep the decimal point in the right spot.

j
```
   $ 3 . 5 2
   ×      4 3
   ──────────

   ──────────
   $
```

k
```
   $ 6 . 4 3
   ×      5 4
   ──────────

   ──────────
   $
```

l
```
   $ 7 . 3 7
   ×      2 9
   ──────────

   ──────────
   $
```

m
```
   $ 4 . 9 3
   ×      3 9
   ──────────

   ──────────
   $
```

2 Solve these problems.

a How many kilometres did the ferry boat travel if it completed 15 trips across the lake which is 6.25 km wide?		**c** How many litres of lemonade did I buy if I bought a dozen of the 1.25 L bottles?
b What is the total mass of 18 bags of flour each weighing 2.45 kg?		**d** How many square metres of tiles are needed for 25 apartments if each apartment needs 5.05 square metres?

Multiply decimals by whole numbers and perform divisions by non-zero whole numbers where the results are terminating decimals, with and without digital technologies

Problem solving, Fluency
N CCT

Decimal number patterns

3 Complete the decimal counting patterns.

a
0.1	0.2	0.3			

d
0.23	0.25	0.27			

b
0.2	0.4	0.6			1.2

e
1.25	1.30	1.35			

c
0.3	0.6	0.9	1.2		

f
1.67	1.70	1.73			

4 Use the constant addition function on your calculator to make the following patterns.

a $1 + 0.5 = 1.5 = 2 = 2.5 = \boxed{} = \boxed{} = \boxed{}$

b $1.5 + 0.1 = \boxed{} = \boxed{} = \boxed{} = \boxed{} = \boxed{} = \boxed{}$

c $2.3 + 0.2 = \boxed{} = \boxed{} = \boxed{} = \boxed{} = \boxed{} = \boxed{}$

d $1.8 + 0.3 = \boxed{} = \boxed{} = \boxed{} = \boxed{} = \boxed{} = \boxed{}$

e $2.3 + 0.6 = \boxed{} = \boxed{} = \boxed{} = \boxed{} = \boxed{} = \boxed{}$
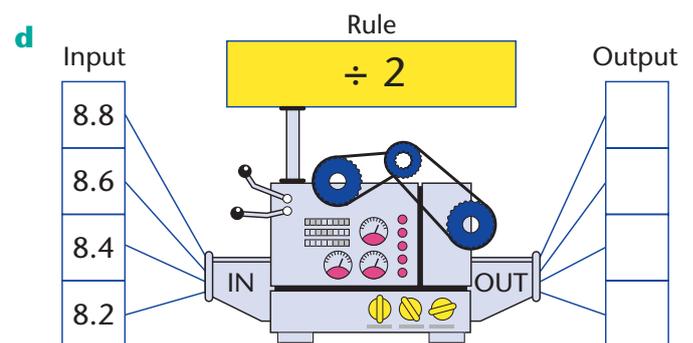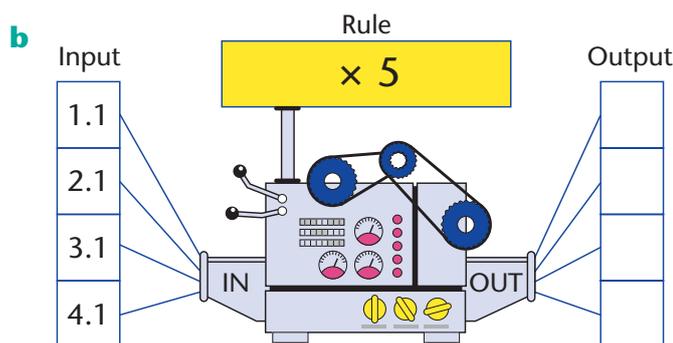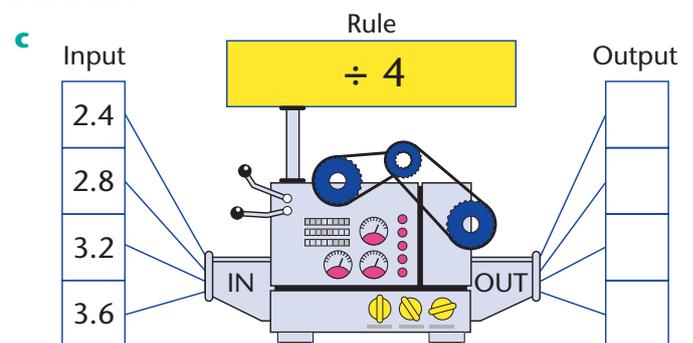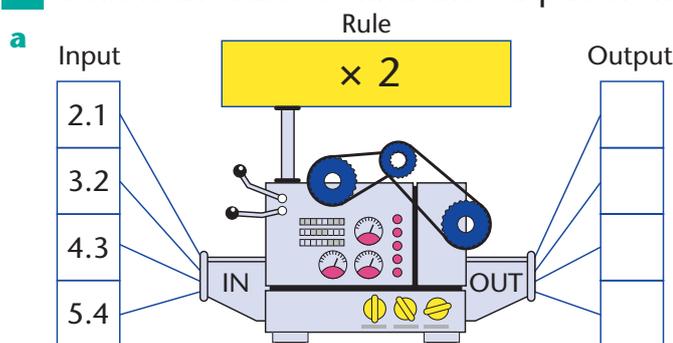
f $2.6 + 0.8 = \boxed{} = \boxed{} = \boxed{} = \boxed{} = \boxed{} = \boxed{}$
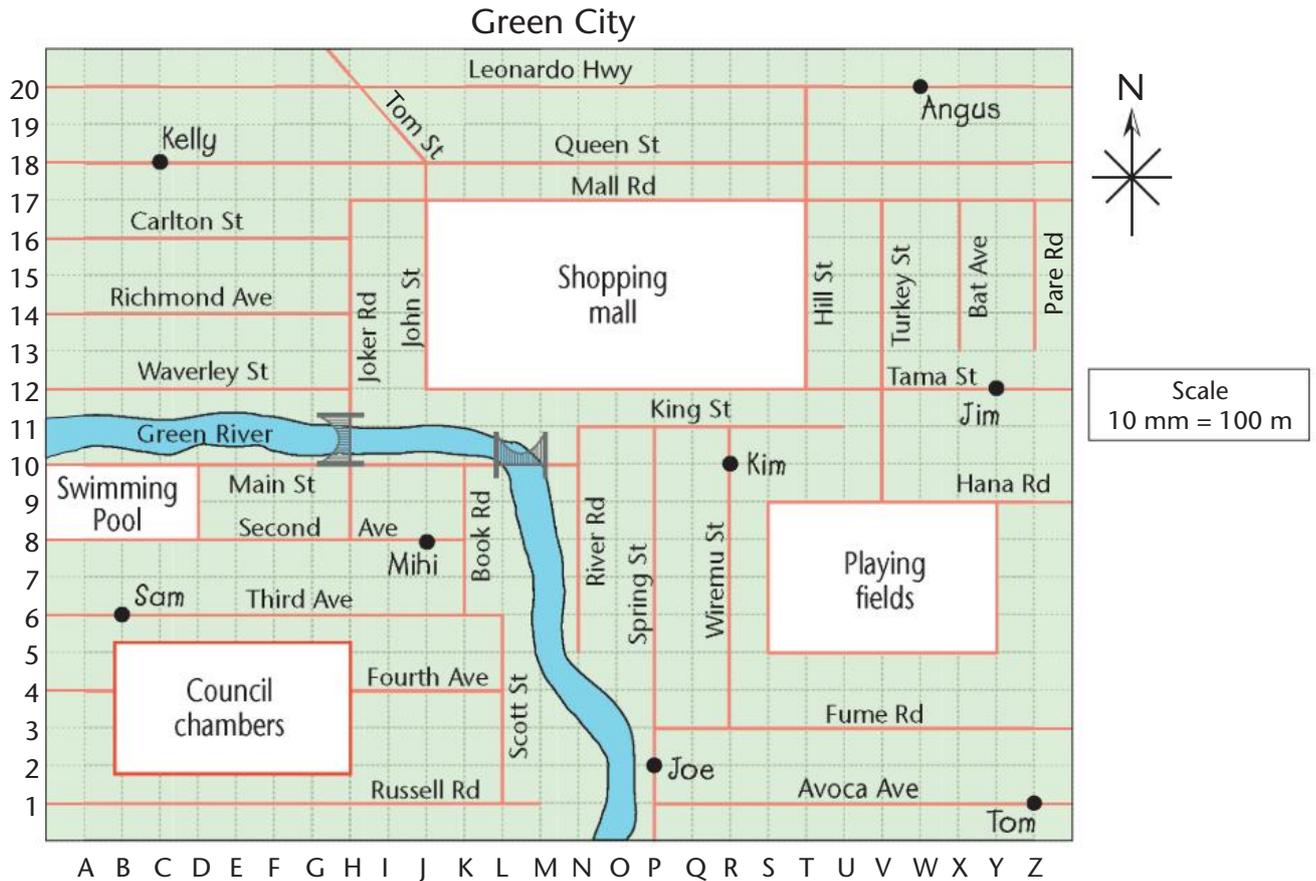
g $2.6 + 2.2 = \boxed{} = \boxed{} = \boxed{} = \boxed{} = \boxed{} = \boxed{}$

h $3.9 + 0.3 = \boxed{} = \boxed{} = \boxed{} = \boxed{} = \boxed{} = \boxed{}$

5 Follow the rules to find the output of the machines.

a Rule: × 2

Input	Output
2.1	
3.2	
4.3	
5.4	

c Rule: ÷ 4

Input	Output
2.4	
2.8	
3.2	
3.6	

b Rule: × 5

Input	Output
1.1	
2.1	
3.1	
4.1	

d Rule: ÷ 2

Input	Output
8.8	
8.6	
8.4	
8.2	

Fluency, Understanding
N CCT

Continue and create sequences involving whole numbers, fractions and decimals.
Describe the rule used to create the sequence

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Grid references

Green City

6 Give the grid reference points of the children marked on the map.

a Kelly _____ c Sam _____ e Mihi _____ g Jim _____

b Joe _____ d Kim _____ f Angus _____ h Tom _____
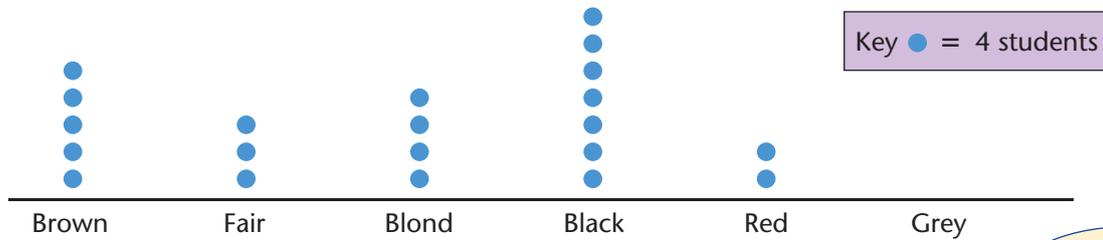
7 Put a cross for these grid reference points on the map.

a A3 b J11 c Y4 d S1 e D19 f G5 g N5

8 Use the scale to calculate the shortest distance from:

a Kelly's house to Kim's _____ m c Kelly's house to Jim's _____ m

b Sam's house to Mihi's _____ m d Joe's house to Mihi's _____ m

9 Use the scale, grid reference points and compass directions to find the secret destination on the map.

a Start at the reference point (J4) then head east for 100 m.

b Turn north and travel another 100 m before heading west for another 50 m.

c Follow Book Rd north until you find Main St then turn left and follow Main St until you find a bridge.

d Head north across the bridge and along Joker Rd until it meets Mall Rd.

e Head east 600 m then turn left and proceed another 150 m.

f Turn east and travel 150 m to find the secret destination.

g What is the secret destination? _____

Dot plots can show many-to-one correspondence. For example ● = 10 students

Hair colours of Year 6 students

Key ● = 4 students

Brown   Fair   Blond   Black   Red   Grey

10 How many students had:

a brown hair? _____   **c** blond hair? _____   **e** red hair? _____

b fair hair? _____   **d** black hair? _____   **f** grey hair? _____

I've got red hair.

11   **High schools that 280 children will be attending**

Key ● = 10 children

Waratah College   Kenworth High   Peechley High   St Pats High   Burton High   Sunshine High
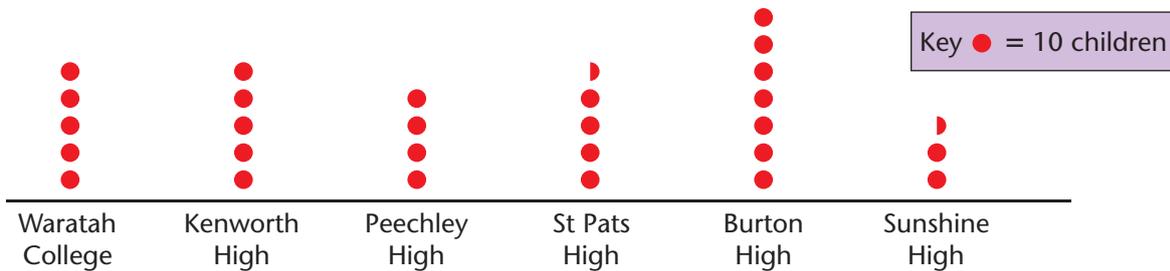
a Which school will have the most children attending? _____

b How many children will be attending Peechley High? _____

c How many children will be attending St Pats High? _____

d How many children will be attending Waratah College? _____

12 Use the supplied data to make the dot plot. You will have to supply a scale for the Key.

Key ● = [ ] children

School census

Prep	35
Year 1	50
Year 2	45
Year 3	60
Year 4	55
Year 5	50
Year 6	55

Prep   Year 1   Year 2   Year 3   Year 4   Year 5   Year 6

Add and subtract 5- and 6-digit numbers
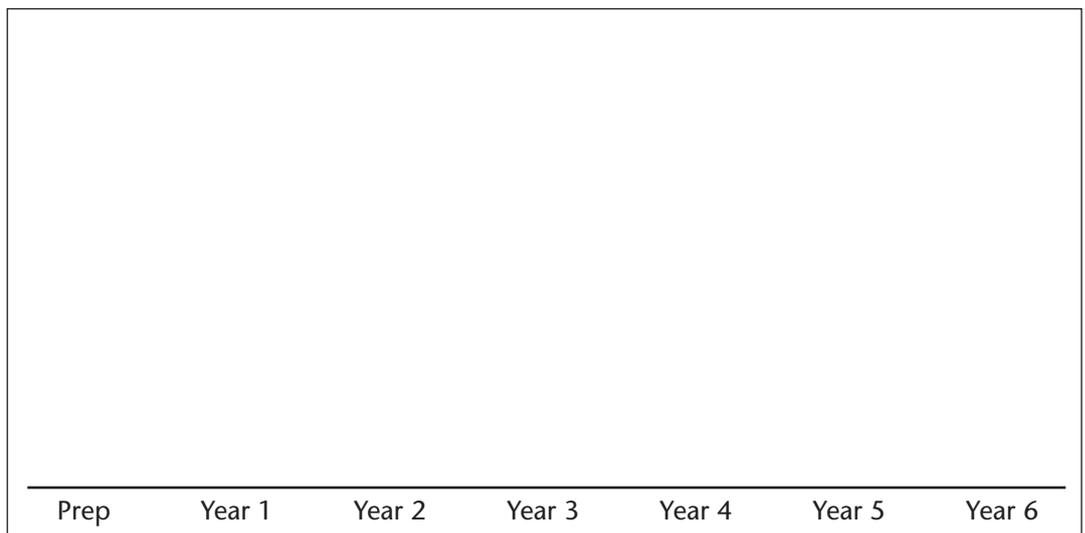
1 Complete these additions and subtractions.

a   kilograms
```
    9 5 . 2 8 7
  + 3 4 . 1 6 2
  _____
              kg
```

b   litres
```
    7 9 . 8 2 6
  - 3 4 . 1 4 9
  _____
               L
```

c   metres
```
    5 8 . 7 2 6
  + 3 4 . 5 7
  _____
               m
```

d   kilometres
```
    8 5 . 3 4 9
  - 2 7 . 4 1
  _____
              km
```

e   hectares
```
    4 7 . 6 3 2
  + 3 1 . 7 7 7
  _____
              ha
```

f   tonnes
```
    8 6 3 7 6
  -   4 9 7 7
  _____
               t
```

g   kilometres
```
    5 8 . 3 6 2
  +   9 . 1 8 7
  _____
              km
```

h   metres
```
    4 9 . 3 8 7
  - 2 1 . 4
  _____
               m
```

i   hectares
```
    7 6 5 8 8
  + 3 4 2 7 8
  _____
              ha
```

j   grams
```
    4 9 . 3 8 7
  -   6 . 7 2 9
  _____
               g
```

k   metres
```
    9 1 6 . 7 2
  - 3 7 5 . 2 9 6
  _____
               m
```

l   kilograms
```
    8 7 5 9 4 6
  + 3 7 2 5 1 8
  _____
              kg
```

m   tonnes
```
    7 9 5 2 . 8 6
  - 3 4 7 2 . 7 5
  _____
               t
```

n   centimetres
```
    8 7 5 2 4 8
  - 3 8 6 7 1 7
  _____
              cm
```

o   litres
```
    5 5 5 9 9 . 9
  + 4 9 4 9 4 . 9
  _____
               L
```

2

Australia's most expensive cars						
Lexus	Audi	Jaguar	Honda NSX	BMW	Porsche	Mercedes
$155 550	$195 000	$216 399	$220 540	$263 999	$300 000	$366 999
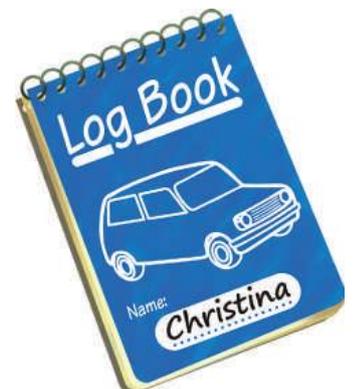
Calculate the difference in price between these cars.

a

Mercedes	$366 999
BMW	$263 999
Difference	$

b

Honda	$
Lexus	$
Difference	$

c

Porsche	$
Jaguar	$
Difference	$

3 **Travelling expenses**

To claim travelling expenses on her tax return, Christina keeps a log book which shows her car's odometer reading at the beginning and the end of each trip. Help her calculate the distances covered and the total amount of travelling she did.

	Date	Beginning of trip	End of trip	Kilometres travelled
a	18/9	38 542	39 461	
b	19/10	43 814	44 002	
c	4/11	44 629	44 913	
d	29/3	52 414	52 739	
e			Total	

Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers

Fluency, Problem solving
L N

Dividing large numbers

4 Use your division skills to divide these large numbers.

$$6 \overline{\smash{)}3\,5^{\,5}7^{\,3}4^{\,4}2\,8} = 5\,9\,5\,7\,1\tfrac{2}{6}$$

a $3 \overline{\smash{)}5\,7\,2\,8}$ **b** $4 \overline{\smash{)}2\,9\,5\,3\,5}$ **c** $5 \overline{\smash{)}6\,5\,4\,2\,5}$

d $4 \overline{\smash{)}2\,5\,9\,6\,3}$ **e** $6 \overline{\smash{)}2\,8\,9\,2\,7}$ **f** $5 \overline{\smash{)}8\,5\,0\,2\,6}$ **g** $6 \overline{\smash{)}3\,6\,9\,2\,7}$

h $7 \overline{\smash{)}8\,6\,7\,4\,2}$ **i** $8 \overline{\smash{)}3\,5\,9\,6\,7}$ **j** $9 \overline{\smash{)}4\,5\,6\,2\,8}$ **k** $10 \overline{\smash{)}2\,9\,7\,3\,8}$

Mental strategies can be used to estimate the quotient when dividing by 9 and 5.
Some strategies are:

$\div 9$ Round the number up and then divide by 10.

$\div 5$ Round the number, divide by 10, then double.

---

5 Use any mental strategy you wish to give the approximate answer to these divisions.

a $1157 \div 9 \approx$ **b** $1462 \div 5 \approx$ **c** $11888 \div 9 \approx$ **d** $99\,218 \div 5 \approx$

e $348.9 \div 5 \approx$ **f** $629.2 \div 9 \approx$ **g** $531.6 \div 9 \approx$ **h** $176.8 \div 5 \approx$

Using a calculator to divide
Larger divisions with divisors larger than 10 can be done with a calculator. $16 \overline{\smash{)}8\,9\,7\,4\,4}$

---

6 Use your calculator to do these.

a $86 \overline{\smash{)}6\,1\,2\,.\,3\,2}$ **b** $92 \overline{\smash{)}4\,7\,5\,.\,6\,4}$ **c** $74 \overline{\smash{)}7\,7\,8\,.\,4\,8}$ **d** $35 \overline{\smash{)}3\,3\,9\,.\,5}$ **e** $26 \overline{\smash{)}2\,2\,4\,9}$

f $47 \overline{\smash{)}6\,9\,1\,.\,3\,7}$ **g** $80 \overline{\smash{)}5\,7\,7\,0}$ **h** $132 \overline{\smash{)}3\,4\,6\,5}$ **i** $129 \overline{\smash{)}3\,8\,7\,0\,0}$ **j** $177 \overline{\smash{)}9\,9\,6\,5\,1}$

7 Use your calculator or other methods to solve these problems.

a A train travels 636 km and stops at 12 stations. What is the average distance between stops?

c Kylie paid $3690 for a TV and video. She is going to pay it off in 18 instalments. How much is each instalment?

b Redleaf Soccer Association received $1365 in fees from the 21 teams in the competition. How much did each team pay?

d Kilcoy cricket team scored 296 runs and 199 runs. What was the average amount of runs scored by the 11 batsmen?

Fluency, Problem solving
N CCT

Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers

107

8 Make a congruent copy of this pyramid by making and folding its net, using light card or heavy paper.

a

8 cm   8 cm

8 cm   8 cm   8 cm

8 cm   8 cm

8 cm   8 cm

8 cm

8 cm

TOP JUICY DRINK   TOP JUICY DRINK

8 cm
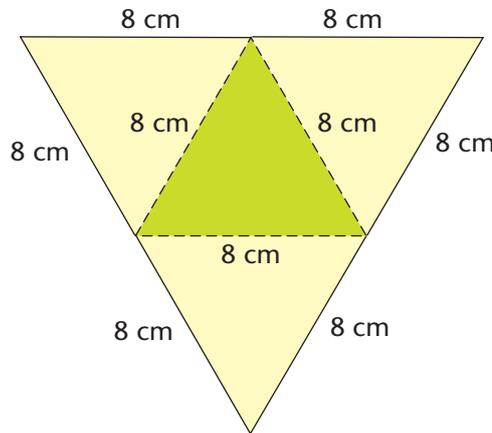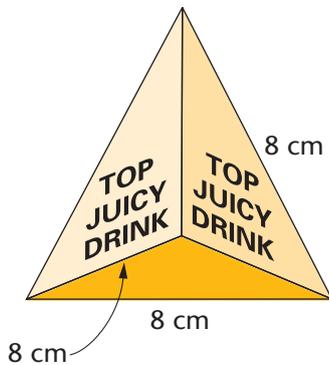
A net is a flat shape which can be folded into a three-dimensional solid.

b This shape is called a _____ .

c It has _____ vertices.

d It has _____ edges.

e It has _____ faces.

f All faces are equilateral _____ .

9 Sketch a net for this pyramid.

a

8 cm

ICE BLOCK

6 cm   6 cm
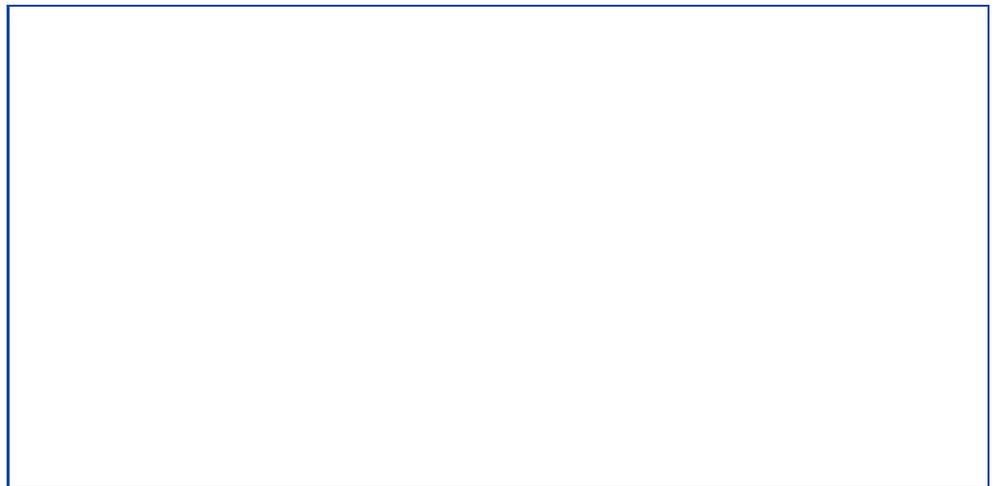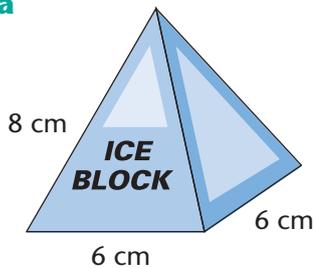
b This shape is called a _____ .

c It has _____ vertices.

d It has _____ edges.

e The base is a _____ .

f Four of its faces are congruent _____ .

10 Explain why these shapes belong to the same family of 3D shapes.
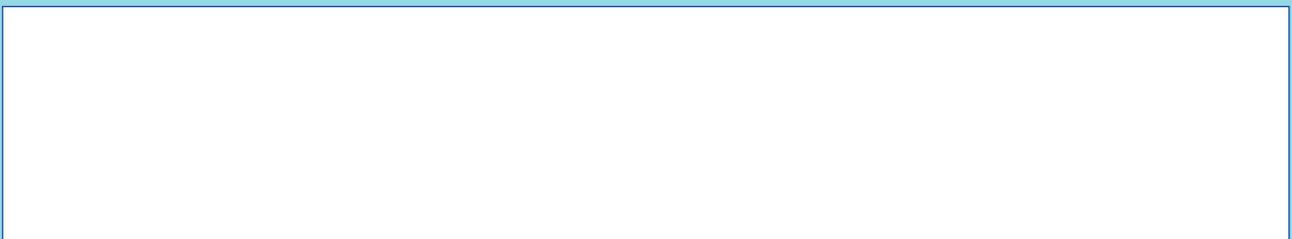
11 **Savings spreadsheet**

Complete this computer-based spreadsheet. The C column has the calculations listed and has been widened to allow for your answers.

	A	B	C
1	Date	Deposit	Subtotal
2	31 Jan	$319.50	(= B2) $319.50
3	28 Feb	$116.30	(= C2 + B3) 435.80
4	31 Mar	$121.40	(= C3 + B4)
5	30 Apr	$213.70	(= C4 + B5)
6	31 May	$118.05	(= C5 + B6)
7	30 June	$214.90	(= C6 + B7)
8	31 July	$325.50	(= C7 + B8)
9	31 Aug	$124.50	(= C8 + B9)

```
  $ 3 1 9 . 5 0
+ $ 1 1 6 . 3 0
  $ 4 3 5 . 8 0
```

Spreadsheets are used to organise, display and calculate.

Bombers' Baseball Club expenses

	A	B	C	D
1	Date	Item	Cost	Balance
2	1 Aug	Opening	—	$3250.00
3	5 Aug	Registrations	$1350.00	(= D2 − C3) $1900.00
4	27 Aug	Mitts	$275.00	(= D3 − C4) $1625.00
5	1 Sep	Bags	$87.00	(= D4 − C5) $1538.00
6	5 Sep	Bats	$723.00	(= D5 − C6) $815.00
7	27 Sep	Balls	$257.00	(= D6 − C7) $558.00
8				(= D7 − C8)
9				(= D8 − C9)
10				(= D9 − C10)
11				(= D10 − C11)

```
  $ 3 2 5 0
− $ 1 3 5 0
  $ 1 9 0 0
```

Spreadsheets on computers calculate at great speed.

12 Add these items to the Bombers' spreadsheet.

a Item 8. On 28 September the club bought helmets for $250.00.

b Item 9. On 11 November the club bought trophies for $178.00.

c Item 10. On 12 November the club spent $40.00 on stamps.

d Item 11. On 15 November the club spent $55.50 on stationery.

Fluency, Problem solving
N CCT

Add and subtract decimals, with and without digital technologies, and use estimation and rounding to check the reasonableness of answers

109

Decimals × powers of ten

1 Use your calculator to answer these questions.

a 0.6 × 10 ⬚ **d** 0.7 × 100 ⬚ **g** 1.7 × 1000 ⬚

b 0.67 × 10 ⬚ **e** 0.85 × 100 ⬚ **h** 1.82 × 1000 ⬚

c 0.367 × 10 ⬚ **f** 0.274 × 100 ⬚ **i** 1.395 × 1000 ⬚

2 Use your calculator to answer these questions.

a 0.47 ÷ 10 ⬚ **d** 0.395 ÷ 100 ⬚ **g** 1.374 ÷ 1000 ⬚

b 0.86 ÷ 10 ⬚ **e** 0.42 ÷ 100 ⬚ **h** 1.29 ÷ 1000 ⬚

c 0.3 ÷ 10 ⬚ **f** 0.6 ÷ 100 ⬚ **i** 1.8 ÷ 1000 ⬚

3 With what do you have to multiply these decimals by to make them into whole numbers? The first has been done for you.

	Decimal	Multiply by	Whole number
a	0.3	× 10	3
b	0.7		
c	0.35		
d	0.654		
e	0.49		

	Decimal	Multiply by	Whole number
f	0.967		
g	0.76		
h	0.5		
i	0.06		
j	0.007		

4 Rewrite these number sentences using whole numbers, and multiplying both numbers by a power of ten. The first one has been done for you. (You may need a calculator.)

a 6.36 ÷ 6 becomes 636 ÷ 600 = 1.06

b 6.4 ÷ 8 becomes _____

c 7.38 ÷ 6 becomes _____

d 7.29 ÷ 3 becomes _____

e 8.54 ÷ 7 becomes _____

f 9.17 ÷ 7 becomes _____

g 7.446 ÷ 6 becomes _____

h 3.655 ÷ 5 becomes _____

i 7.884 ÷ 9 becomes _____

Is 8.675 ÷ 5 equal to 8675 ÷ 5000?

5 Do you get the same answer to the questions **a** to **i** if you don't multiply the original question by a power of ten? _____

Fluency, Reasoning
CCT N

Division of decimals

Dividing decimals

Example: Share 85.8 among 6.

$$\frac{1\ 4.\ 3}{6\ |\ 8\ ^2 5.\ ^1 8}$$

Step 1: The 8 tens are shared among 6, with each person receiving one ten. The remaining 2 tens are traded to 20 ones.

Step 2: There are now 25 ones divided by 6, which gives each person 4 with a remainder of 1. The 1 remainder is traded to become 10 tenths.

Step 3: There are now 18 tenths to be divided by 6 which gives 3 tenths.

6 Calculate the answers to the following divisions.

Use a calculator to check your answers.
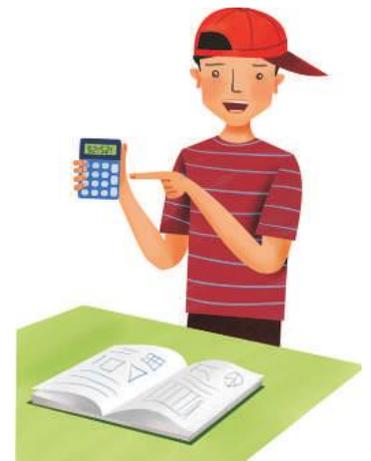
a 3 | 6 3.9 m   **b** 4 | 8 4.8 m   **c** 2 | 8 6.4 m   **d** 3 | 9 6.3 m

e 4 | 9 6.8 kg   **f** 2 | 7 2.8 kg   **g** 5 | 7 5.5 kg   **h** 3 | 7 5.9 kg

i 5 | 5 6.5 m   **j** 6 | 6 7.2 m   **k** 3 | 6 7.2 m   **l** 4 | 8 9.6 m

m 5 | $ 6.8 5   **n** 3 | $ 5.7 6   **o** 2 | $ 3.6 6   **p** 6 | $ 9.1 2

q 8 | 1 0.9 6 m   **r** 4 | 5.0 4 m   **s** 5 | 7.6 5 m   **t** 4 | 6.5 6 m

7 The total distance jumped by some long jumpers is given. Calculate the average length of each jump.

a Jai jumped a total distance of 24.69 m in 3 attempts. What was the average length of his jumps?

b Teagan jumped a total distance of 27.68 m in 4 attempts. What was the average length of her jumps?
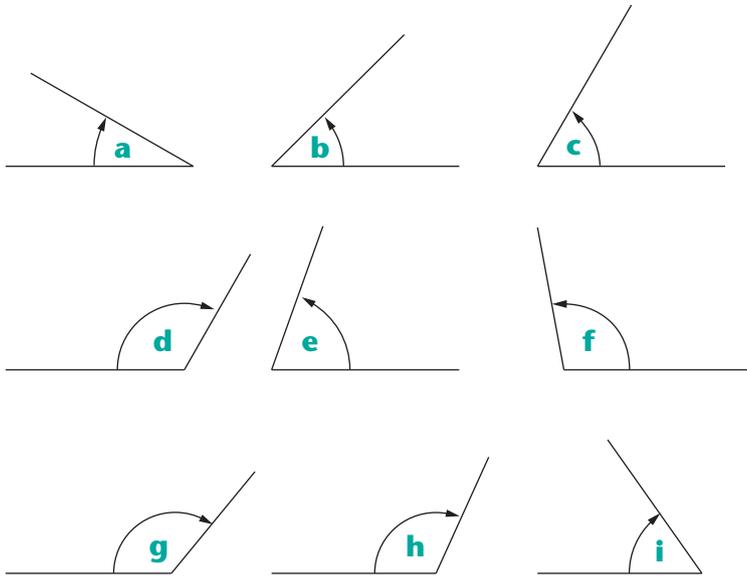
8 Calculate how much each person's share of the bill was at these restaurants.

a $9.96

b $84.56

c $96.55

Fluency, Problem solving
N CCT

Multiply decimals by whole numbers and perform divisions by non-zero whole numbers where the results are terminating decimals, with and without digital technologies

111
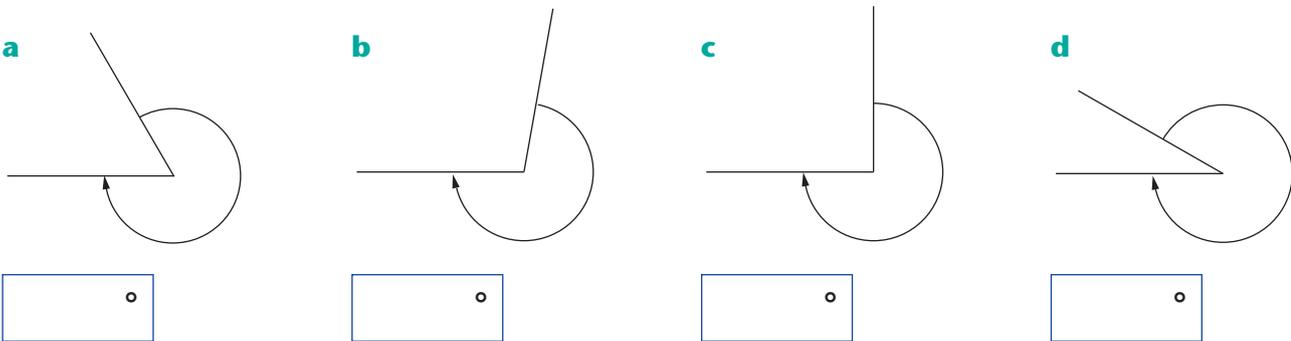
9 Estimate the size of each angle before measuring it.
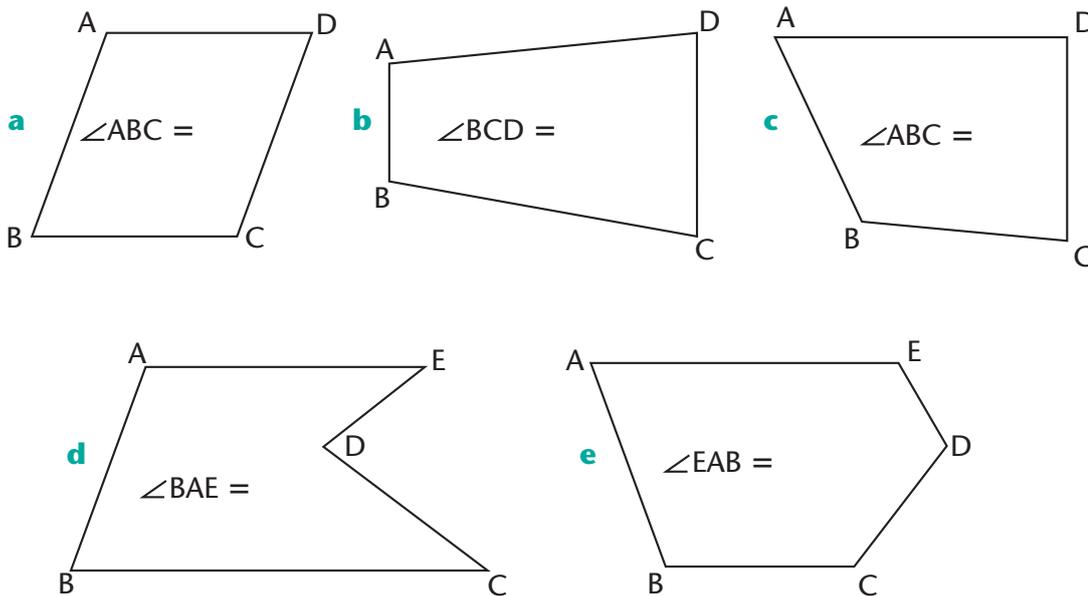
Angle	Estimate	Degrees
a		
b		
c		
d		
e		
f		
g		
h		
i		
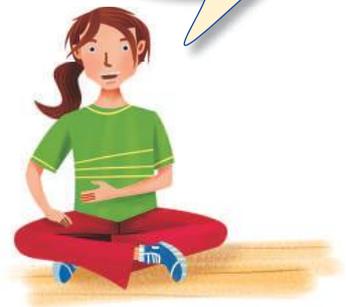
10 Calculate the size of each reflex angle by measuring the smaller angle first then subtracting it from 360°.

a

b

c

d

° ° ° °

11 Measure and record these internal angles.

a ∠ABC =

b ∠BCD =

c ∠ABC =

> The symbol for angle is ∠. For example ∠ABC is the angle between lines AB and BC.

d ∠BAE =

e ∠EAB =

Investigate, with and without digital technologies, angles on a straight line, angles at a point and vertically opposite angles. Use results to find unknown angles

Problem solving, Reasoning
N L CCT

12 A pattern of hexagons
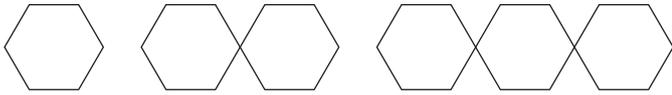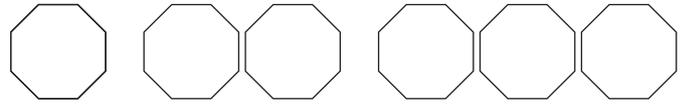
a Complete the table to record the number of sides needed to make the pattern.

Hexagons	1	2	3	4	5	6
Sides						

b Plot the ordered pairs to represent your data. Draw a line to make a graph.
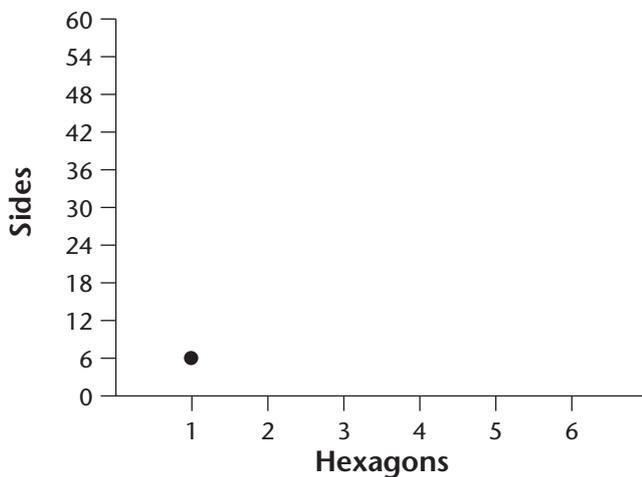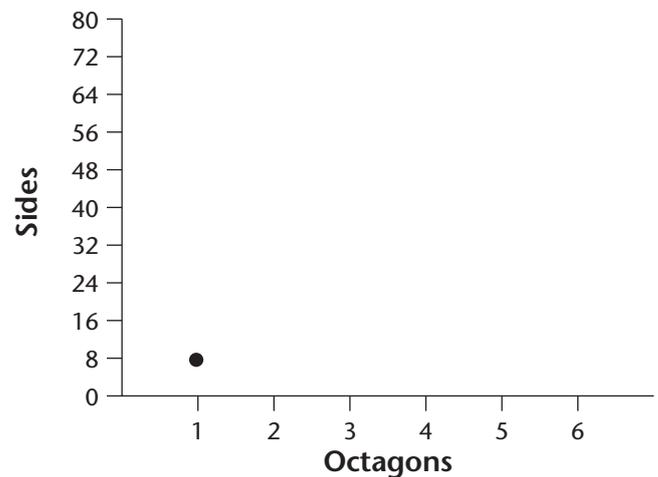
13 A pattern of octagons

a Complete the table to record the number of sides needed to make the pattern.

Octagons	1	2	3	4	5	6
Sides						

b Plot the ordered pairs to represent your data. Draw a line to make a graph.

14 Complete these tables to describe the number of sides for the number of polygons.

a

Decagons	1	2	3	4	5
Sides		20			50
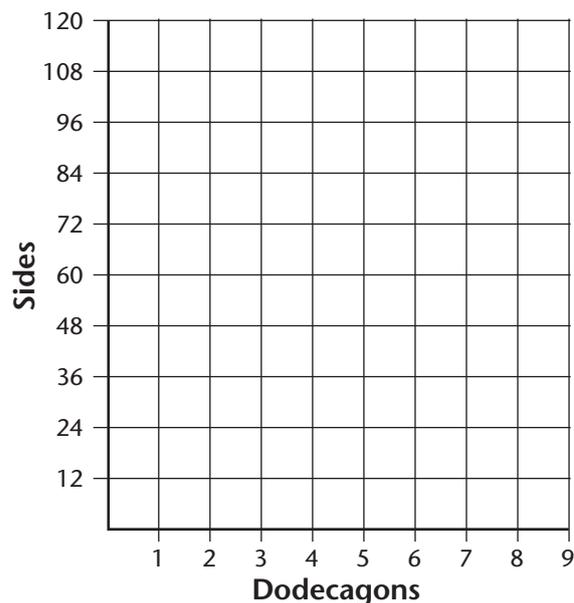
b Plot the ordered pairs then make a graph.

c
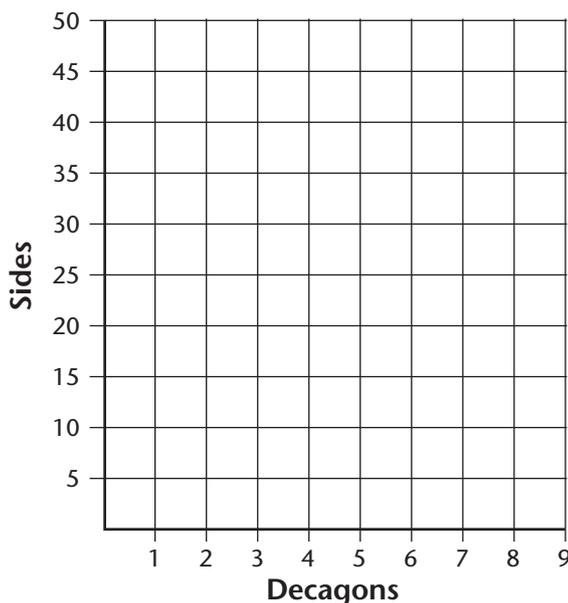
Dodecagons	1	2	3	4	5	6	7	8
Sides	12			48				96

d Plot the ordered pairs then make a graph.

Diagnostic review 3

PART 1

a Apply the rule to complete this pattern.

$\blacksquare \times 4 - 2 = \bullet$

$\blacksquare$	6	7	8	9	10	11	12	13	14
$\bullet$									

b Reverse the rule to find the top row of numbers.

$\blacksquare \times 5 + 3 = \bullet$

$\blacksquare$									
$\bullet$	18	23	28	33	38	43	48	53	58

PART 2

Complete these operations.

a $\quad 1.48 \times 4$

b $\quad 27.35 \times 7$

c $\quad 17.28 \times 5$

d $\quad 21.05 \times 6$

e $\quad 36.72 \times 3$

f $\quad 19.48 \times 8$

g $\quad 243 \times 32$

h $\quad 528 \times 45$

4 for $38.12   *3 for $93.60*   *2 for $132.46*

Calculate the cost of one of each item.

i One CD _____

j One watch _____

k One video game _____

Write all the factors of:

l 16 _____

m 21 _____

PART 3

Make more equivalent fractions.

a $\dfrac{1}{3} = \dfrac{2}{6} = \dfrac{\square}{9} = \dfrac{\square}{12} = \dfrac{\square}{15}$

b $\dfrac{1}{5} = \dfrac{\square}{10} = \dfrac{\square}{15} = \dfrac{\square}{20} = \dfrac{\square}{25}$

Use = or ≠ to describe these fractions.

c $\dfrac{2}{5} \,\square\, \dfrac{4}{10}$

e $\dfrac{3}{4} \,\square\, \dfrac{4}{5}$

d $\dfrac{3}{4} \,\square\, \dfrac{8}{10}$

f $\dfrac{2}{8} \,\square\, \dfrac{1}{5}$

PART 4

Calculate these percentages.

a	10% of $50	$
b	25% of $100	$
c	50% of $40	$
d	20% of $80	$
e	70% of $90	$

f Davina scored 90% in her spelling test. How many words did she spell correctly if there were 50 words in the test?

_____

PART 5

Plot the ordered pairs. Then, join the dots in the order they have been given to create a shape.
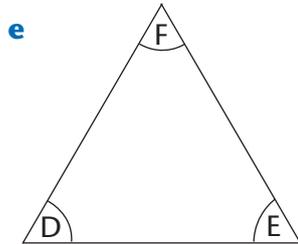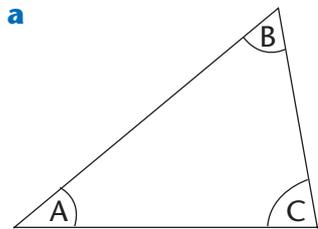
(3,5) (4,4) (5,4) (4,3) (5,2) (4,2)
(3,1) (2,2) (1,2) (2,3) (1,4) (2,4)
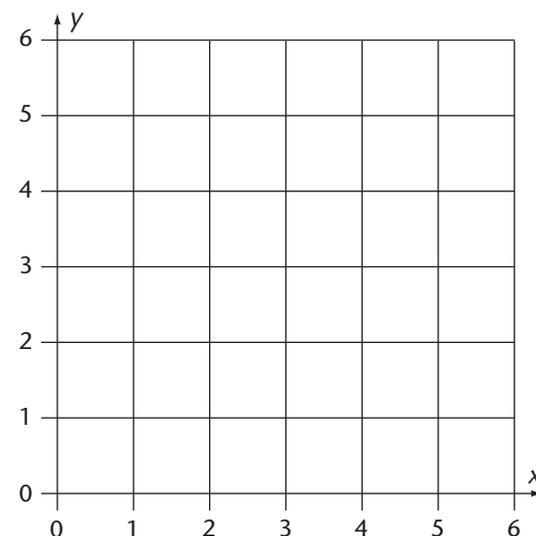
PART 6

Below each triangle, write its name. Use a protractor to measure the angles of the triangles and write them down.

a

e

_____   _____

b $\angle$ A = _____   **f** $\angle$ D = _____
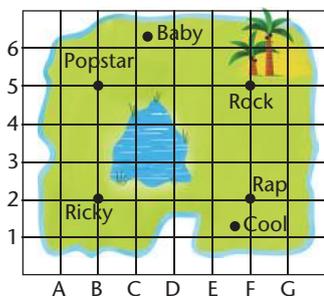
c $\angle$ B = _____   **g** $\angle$ E = _____

d $\angle$ C = _____   **h** $\angle$ F = _____

PART 7

Name the grid reference points for each town.

a Rock _____   **c** Popstar _____

b Ricky _____   **d** Rap _____
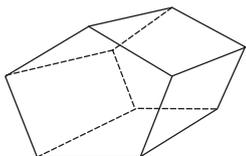
Using a scale of 1 cm = 100 m find the distances between:

e Rock and Rap _____ m

f Popstar and Rock _____ m

g Cool and Baby _____ m

PART 8
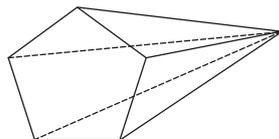
Do these objects belong to the same family?

Why? _____

PART 9

Order the measurements from least to greatest.

a 36 mm, 3.6 m, 3 m, 36 cm

_____

b 45 cm, 4.5 m, 4 cm, 45 mm

_____

c 502 cm, 0.5 m, 2.5 m, 60 cm

_____

PART 10
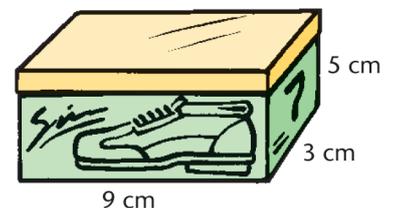
Use 24-hour time to show the time each movie will finish. Fill in the times for Start and Finish.

Movie	Start	Duration	Finish
Special Day	1530	90 min	
Domino	1615	85 min	
Thai Tiger	1805	95 min	
The Red Car		90 min	2000
Sunshine		80 min	2040
The Secret	1930	80 min	

PART 11

Calculate the volume of this packet in cubic centimetres.

_____ cm^3

5 cm

3 cm

9 cm
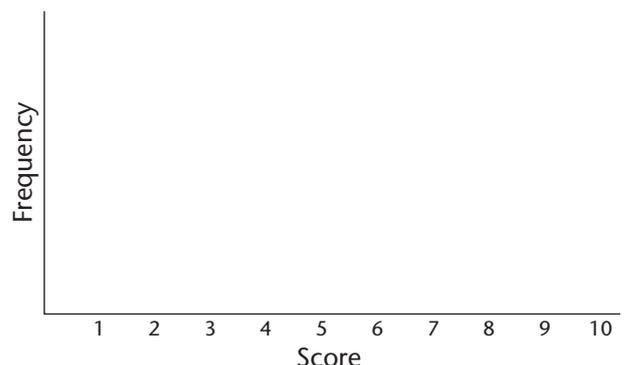
PART 12

Create a dot plot to represent these quiz scores.

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

Frequency

1 2 3 4 5 6 7 8 9 10

Score

1 Display how these number sentences can be done on a number line. The first one has been done for you.

a $7 + 4 - 10 - 8 =$

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

b $9 + 3 - 6 - 5 - 2 =$

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

c $-16 + 7 + 5 + 2 + 4 + 5 =$

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

d $-2 + 7 - 11 - 7 =$

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

-16 -15 -14 -13 -12 -11 -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
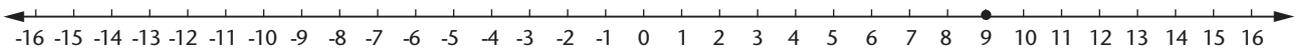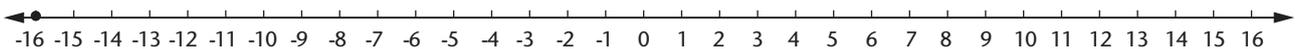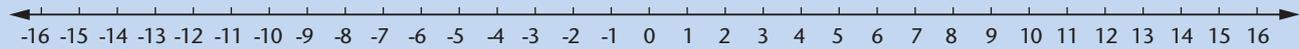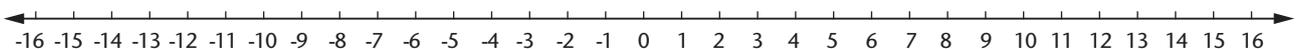
2 Solve the number sentences. The number line above will assist you.

a $-10 + 6 + 2 =$

b $10 - 7 - 8 =$

c $12 - 8 - 8 =$

d $12 - 7 - 7 =$

e $14 - 6 - 9 =$

f $-15 + 8 + 8 + 8 =$

g $6 + 2 - 9 - 5 =$

h $0 - 2 + 7 + 3 =$

i $-1 + 6 - 10 - 2 =$

j $-5 + 7 + 6 - 4 =$

k $10 + 3 - 9 - 7 - 2 =$

l $7 + 4 - 8 - 10 + 1 =$

m $-10 + 10 - 7 + 7 + 3 =$

n $-3 + 7 + 2 - 9 + 2 =$

o $-2 + 3 - 8 - 2 + 1 =$

3 Write a number sentence or story of your own and solve it on the number line.

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

116 Investigate everyday situations that use integers.
Locate and represent these numbers on a number line

Understanding
CCT N

4 Calculate the answers to the divisions. Remember to keep the decimal points in a straight line.

a 2⟌8.42 m **b** 3⟌12.9 m **c** 4⟌16.24 m **d** 6⟌372.66 m

e 7⟌$50.40 **f** 4⟌$37.60 **g** 6⟌252.60 **h** 4⟌$124.80

i 7⟌11.97 kg **j** 8⟌347.28 kg **k** 9⟌36.36 kg **l** 4⟌147.44 kg

5 Shopping problems

SOAP
5 for $2.15

SOFTA
Toilet Rolls
$2.24
for a 4-pack

TOMATO
SAUCE
3 for $1.86

ORANGE JUICE
1 L for $2.50

DRINKS
6 x 250 mL
pack for
$3.60

a If 3 bottles of tomato sauce cost $1.86, how much would one bottle cost?

$_____

b What is the cost of one cake of soap?

$_____

c How much would I save if I bought a 4-pack toilet roll instead of four rolls at 80c each?

$_____

d Which is cheaper per litre: one litre of juice or the 250 mL cartons?

$_____

6 Mark Amy's division test with ticks or crosses, then give her a mark expressed as a percentage.

a 2⟌9.86 = 4.93 **b** 3⟌8.46 = 2.82 **c** 5⟌36.65 = 7.33 **d** 4⟌53.28 = 13.32 **e** 6⟌26.46 = 4.41

f 7⟌123.34 = 16.62 **g** 8⟌99.92 = 12.46 **h** 8⟌439.84 = 54.98 **i** 9⟌101.7 = 11.3 **j** 4⟌99.92 = 24.99

k ☐ %

Fluency, Problem solving
N CCT PSC

Multiply decimals by whole numbers and perform divisions by non-zero whole numbers where the results are terminating decimals, with and without digital technologies

117

In a collection of data, the number of times an event occurs is its **frequency**.
A frequency table is used to display this data.

7 Complete the frequency column for this set of scores from 60 students taking part in a spelling competition. Transfer your data onto the column graph which has also been started for you.

a Spelling Quiz

Score	Tally	Frequency
1	|	1
2	|||	3
3	||||	4
4	||	
5	⦀⦀ |||	
6	⦀⦀ ||	
7	⦀⦀ ⦀⦀	
8	⦀⦀ ⦀⦀ |||	
9	⦀⦀ ||||	
10	|||	
Total		60

b Spelling Quiz Results
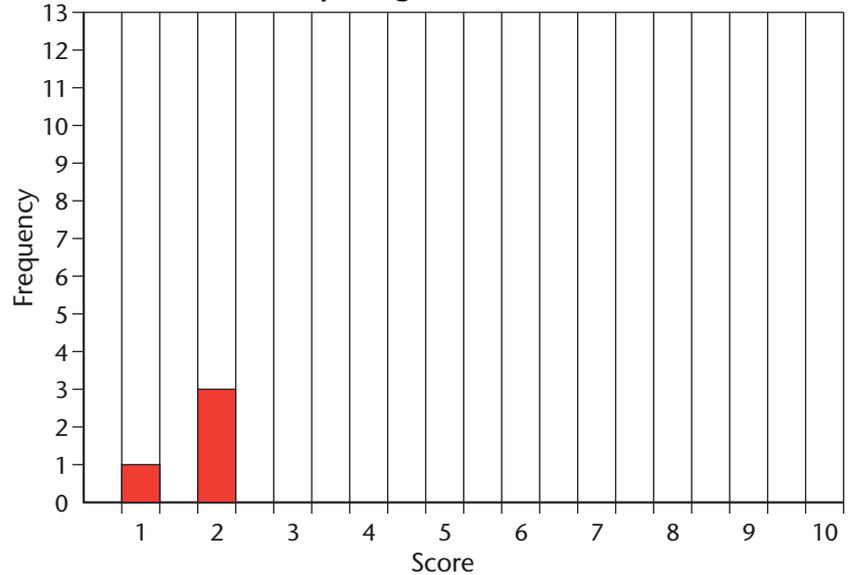
8 Use your data to answer these questions.

a Which score occured most frequently? _____

b Which score occured least frequently? _____

c Which score had a frequency of 10? _____

d Which two scores had a frequency of 3? _____

e How many people had scores less than 5? _____

Nine people scored 9.
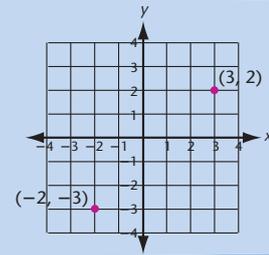
9 Conduct a survey of your class to see which month most people were born in. Before you conduct your survey predict which month you think will have the highest frequency. _____

Month	Tally	Frequency
January		
February		
March		
April		
May		
June		

Month	Tally	Frequency
July		
August		
September		
October		
November		
December		

118 Interpret and compare a range of data displays, including side-by-side column graphs for two categorical variables

Problem solving
N L CCT

The **Cartesian plane** consists of two intersecting lines.
These are called the *x-axis* and the *y-axis*.
The *x* and *y* axes intersect at point zero,
which allows us to graph negative numbers.
The first coordinate graphed is always the *x*-axis
and the second is the *y*-axis. They are called ordered pairs.

10 Plot these ordered pairs on the Cartesian plane supplied. Remember that the first number in the ordered pairs is always graphed on the *x*-axis.

a
A (6, 3)   E (−4, −2)

B (2, 1)   F (−2, −1)

C (−6, 4)   G (−6, −3)

D (4, 2)   H (7, −4)

b List all ordered pairs that are in a straight line. Hint: It takes at least 3 to be sure there is a straight line.

_____

_____
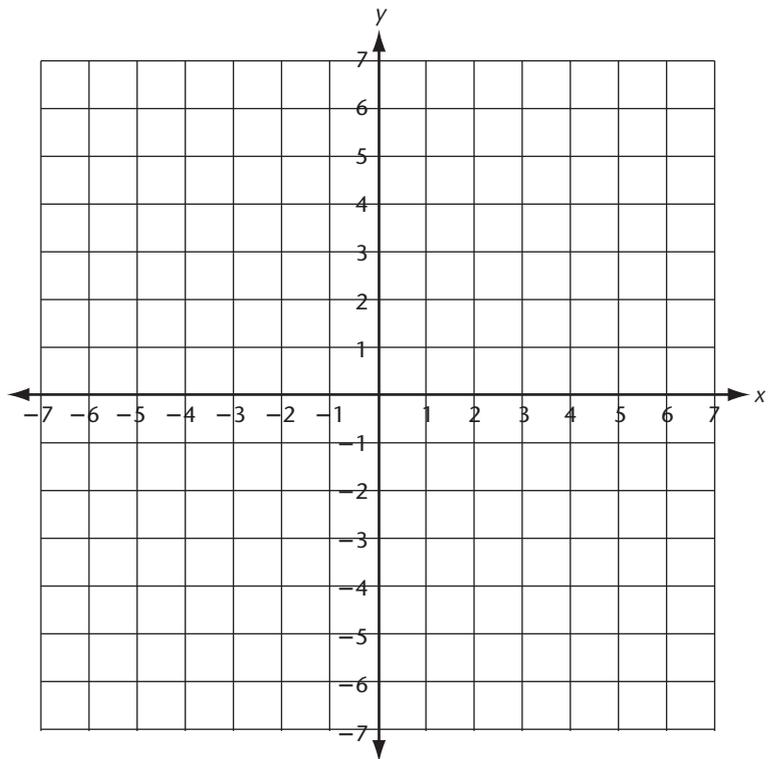
11 Jack has put 4 ordered pairs in each quadrant of the Cartesian plane.

Write the ordered pair that represents the position of each letter on the Cartesian plane.

A (,   )   G (,   )

B (,   )   H (,   )

C (,   )   I (,   )

D (,   )   J (,   )

E (,   )   K (,   )

F (,   )   L (,   )

Decimal remainders
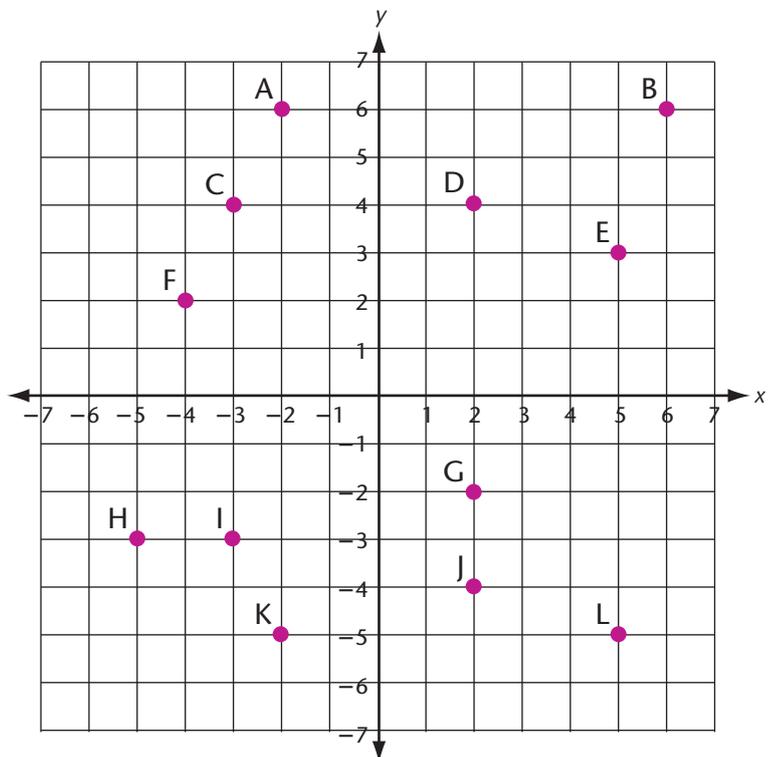
1 Complete these divisions writing the remainders as a fraction as you did on page 64.

$$12\tfrac{1}{3}$$

a $3\,\overline{)3\ 7}$ b $5\,\overline{)3\ 6\ 1}$ c $6\,\overline{)7\ 4\ 1}$ d $4\,\overline{)6\ 3\ 3}$ e $7\,\overline{)6\ 4\ 9}$

f $6\,\overline{)2\ 2\ 2\ 7}$ g $7\,\overline{)3\ 5\ 9\ 3}$ h $3\,\overline{)2\ 6\ 7\ 2}$ i $4\,\overline{)1\ 3\ 4\ 4}$ j $8\,\overline{)1\ 0\ 1\ 9}$

k $6\,\overline{)2\ 7\ 5\ 0}$ l $8\,\overline{)1\ 0\ 5\ 9}$ m $3\,\overline{)1\ 6\ 4\ 2}$ n $6\,\overline{)2\ 6\ 7\ 5}$ o $4\,\overline{)1\ 6\ 7\ 0}$

2 Answer these divisions with a calculator and write your answer in the displays. Round all decimals to 3 decimal places if necessary.

a $125 \div 4 =$ ⬚   e $3343 \div 10 =$ ⬚   i $1237 \div 5 =$ ⬚

b $881 \div 4 =$ ⬚   f $4567 \div 10 =$ ⬚   j $2587 \div 8 =$ ⬚

c $881 \div 8 =$ ⬚   g $2699 \div 10 =$ ⬚   k $3670 \div 3 =$ ⬚

d $371 \div 10 =$ ⬚   h $2455 \div 3 =$ ⬚   l $7352 \div 6 =$ ⬚

You will have noticed that the calculator gives a different answer to questions where there is a remainder. This is because the calculator gives the remainder as a decimal. You can do this as well by dividing the numerator by the denominator to give a decimal remainder or adding a decimal point and zeros until you get a suitable answer.

$6\tfrac{1}{4}$ becomes 6.25

$4\,\overline{)2\ 5}$ because $\tfrac{1}{4} = 0.25$

$$6\ .\ 2\ 5$$
$4\,\overline{)2\ 5\ .\ 0\ 0}$ ⟵ Adding zeros

3 Solve these divisions by adding zeros until a suitable answer is found. The first one is done for you.

$$3\ .\ 2\ 5$$

a $4\,\overline{)1\ 3\ .\ ^10^20}$ b $5\,\overline{)2\ 7}$ c $4\,\overline{)3\ 3\ 7}$ d $4\,\overline{)2\ 4\ 6}$

e $5\,\overline{)3\ 5\ 7}$ f $5\,\overline{)6\ 7\ 4}$ g $8\,\overline{)5\ 2\ 1}$ h $8\,\overline{)6\ 2\ 7}$

i $6\,\overline{)3\ 9}$ j $8\,\overline{)6\ 6\ 8}$ k $6\,\overline{)6\ 5\ 1}$ l $8\,\overline{)4\ 9\ 9}$

4 Use your calculator to answer these problems. Round any overflow displays on your calculator to 3 decimal places.

a Sarah divided a 49-m piece of rope into 4 sections. How long is each section? _____

b Janice shared 565 mL of liquid between 6 vessels. How much is in each vessel? _____

c $85 054 was shared between 8 people. How much did each person receive? _____

Multiply decimals by whole numbers and perform divisions by non-zero whole numbers where the results are terminating decimals, with and without digital technologies

Fluency, Understanding
N CCT

Equations
Marcus is working out how many days of leave he has. He has 5 days of normal holiday and six weeks of long-service leave. He works 5 days a week. If this was recorded as an equation it would look like this: $5 + 5 \times 6 = 35$

5 Solve these equations.

a $42 + 5 \times 9 =$

b $100 - 6 \times 8 =$

c $6 \times 8 \div 2 =$

d $72 \div 8 \times 5 =$

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

f $150 + 30 \div 5 =$

g $5 + 50 \div 5 =$

h $100 - 56 \div 7 =$

i $200 + 200 \div 1 =$

j $123 + 54 \div 9 =$

> $5 + 50 \div 5 = ?$
> Divide before adding.
> $5 + 50 \div 5 = ?$
> $5 + 10 = 15$

6 Place brackets where required to make the equations correct. In some cases the order of the operations will not change, because calculating from left to right will give the correct solution.

a $7 \times 6 + 3 = 45$

b $35 \div 5 \times 4 = 28$

c $7 \times 9 + 17 = 80$

d $6 + 7 \times 4 = 52$

e $16 \times 2 - 2 = 30$

f $37 + 3 \times 3 = 120$

g $10 \times 2 + 9 = 110$

h $75 \div 5 \times 2 = 30$

i $6 + 50 \div 8 = 7$

j $63 - 6 \div 3 = 61$

> $(37 + 3) \times 3 = 120$
> is different to
> $37 + 3 \times 3 = 46.$

7 Create your own equations with brackets and ask a friend to solve them.

a

b

c

d

8 Three people have attempted to solve a problem. Tick the solution you agree with and explain why.

Three adults and five kids bought movie tickets. What was the total cost if tickets were $9 each?

a Helga

$3 + 5 \times 9 = \$48$

b Mikos

$9 \times 3 + 5 = \$32$

c Adele
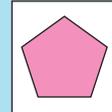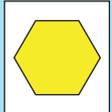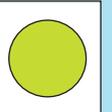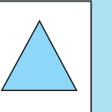
$(3 + 5) \times 9 = \$72$

Courtney has 5 cards with 2D shapes drawn on them. She is going to put them in a bag and will get her friend to pick one out.
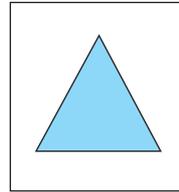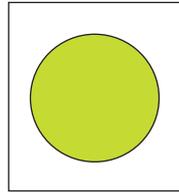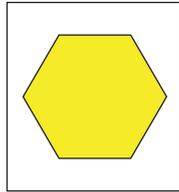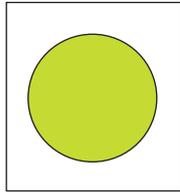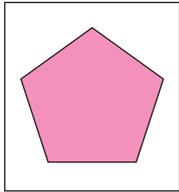
9 Predict the likelihood of each shape card being selected as her first pick.

Record each likelihood as a fraction.

a $\frac{\square}{5}$ b $\frac{\square}{5}$ c $\frac{\square}{5}$ d $\frac{\square}{5}$
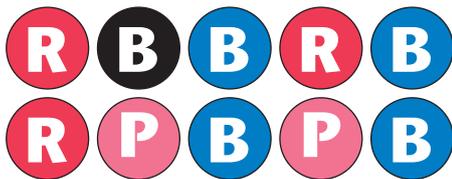
10 **Experiment**

a Make a set of cards like the ones above.

b Place your cards in a bag and make 20 draws using all 5 cards each time.

c Use tally marks (卌) to record your results.

11 Explain how your experiment results compare to your predictions in Exercise 1.

_____

_____

Jimmy has bought 100 rainbow ball lollies for his party. He put his hand in his bag and pulled out the following sample of 10 lollies.

R B B R B
R P B P B

12 Use the sample above to predict how many lollies of each colour were in the bag.

a Red _____   b Blue _____   c Pink _____   d Black _____

13 If there was a bag of 500 lollies and Jimmy pulled out the same 10 lollies, how many of each colour do you think there would be in the bag?

a Red _____   b Blue _____   c Pink _____   d Black _____

Compare observed frequencies across experiments with expected frequencies

Reasoning, Understanding
CCT N

14 Using a scale

Calculate the cost of building this new home. You will need to apply your knowledge of area, perimeter, multiplication and addition. (You may need a calculator.)

Scale 1 cm = 1 m
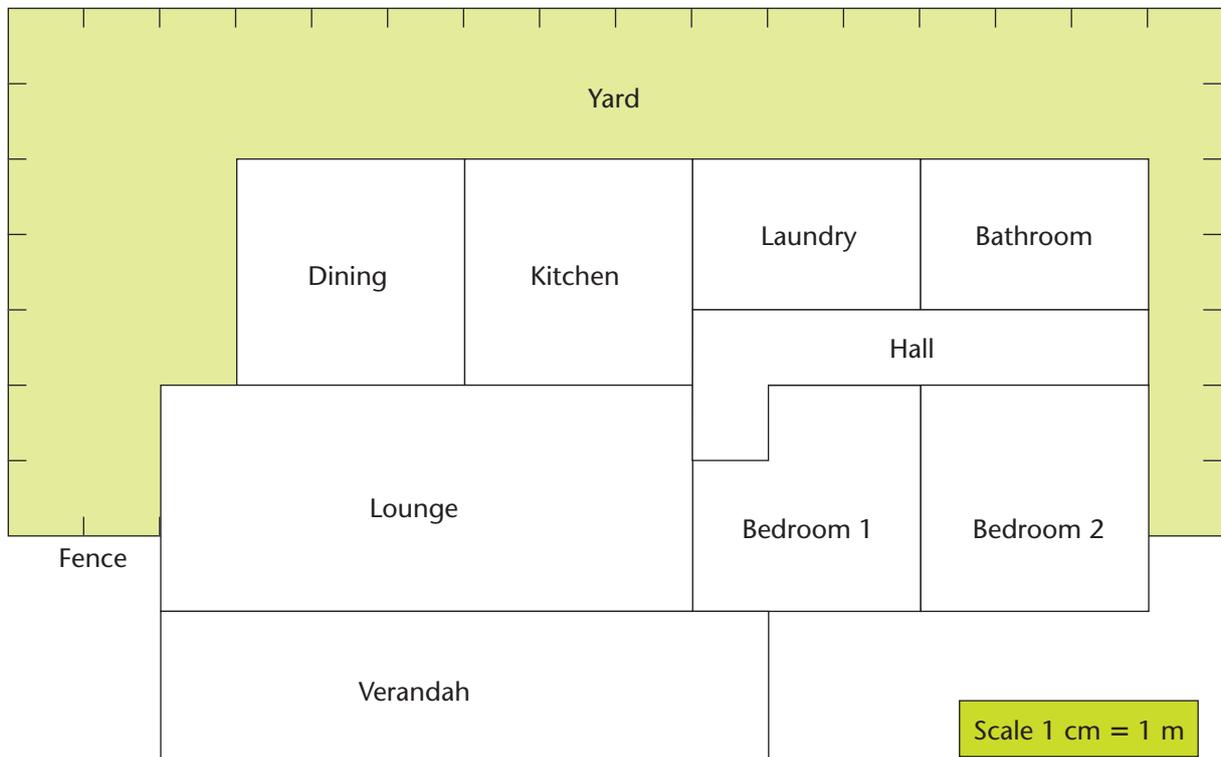
Read carefully.

- You hope to carpet the lounge, dining room, hall and bedrooms.
- You plan on having quarry tiles in the kitchen and on the verandah.
- The laundry and bathroom will have mosaic tiles.
- The fence encloses the yard.

	Facts to be considered	Sub-totals
a	The land you plan to buy will cost at least $220 000.	$220 000
b	The house drawn on the plan would cost $79 000.	
c	Fences cost $20 per metre.	
d	Carpets cost $70 per square metre.	
e	Mosaic tiles cost $50 per square metre.	
f	Quarry tiles cost $40 per square metre.	
g	The home will have a pool costing $25 570.	
h	A single garage will cost $15 500.	
i	**Total cost**	

Multiplication strategies

1 Complete these multiplications.

a	b	c	d	e
1 4 6	2 0 5	4 3 6	8 7 4	8 2 9
× 5 8	× 4 8	× 7 5	× 6 3	× 8 2

_____ _____ _____ _____ _____

_____ _____ _____ _____ _____

_____ _____ _____ _____ _____

2 Circle the estimate you think is most accurate. Use a calculator to check your estimates.

	Question	Estimated answers		
a	63 × 49	3000	30 000	300 000
b	497 × 41	2000	20 000	200 000
c	292 × 62	180	1800	18 000
d	58 × 36	200	2000	20 000
e	95 × 52	5000	50 000	500 000

	Question	Estimated answers		
f	59 × 71	4200	42 000	420
g	149 × 52	75 000	750	7500
h	99 × 103	1000	100 000	10 000
i	1999 × 9	20 000	2000	200 000
j	248 × 42	100 000	1000	10 000

3 Use the strategy of guess and check to choose the correct multipliers.

48	78	45	54	37

a	b	c	d	e
9 6	7 2	4 8	8 5	4 9
× ☐☐	× ☐☐	× ☐☐	× ☐☐	× ☐☐
4 8 0	5 7 6	3 3 6	6 8 0	1 9 6
3 8 4 **0**	2 8 8 **0**	1 4 4 **0**	5 9 5 **0**	2 4 5 **0**
4 3 2 0	3 4 5 6	1 7 7 6	6 6 3 0	2 6 4 6

4 Calculate the flight distances covered.

Darwin
Cairns
1305 km
2852 km
1391 km
Alice Springs
3155 km
2022 km
Brisbane
752 km
1167 km
706 km
Sydney
Adelaide
237 km
Canberra
Melbourne
610 km
Hobart

	Flights	Trips	Distances
a	Sydney to Brisbane	34	
b	Sydney to Melbourne	58	
c	Sydney to Adelaide	27	
d	Sydney to Alice Springs	13	

Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers

Problem solving, Reasoning
CCT N

Prime factors
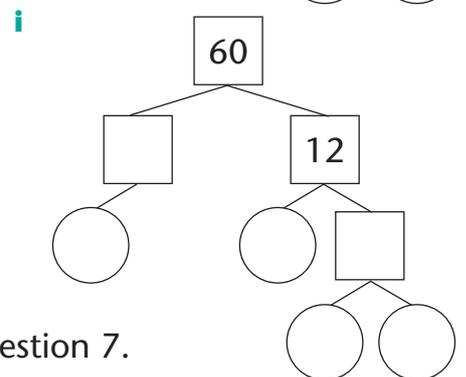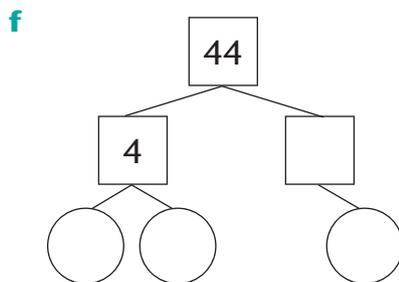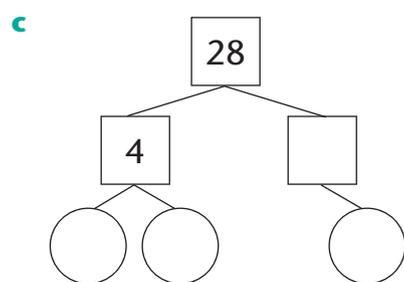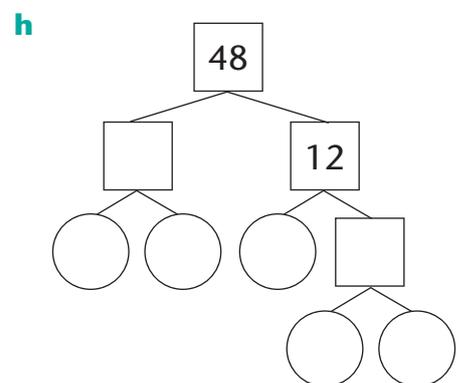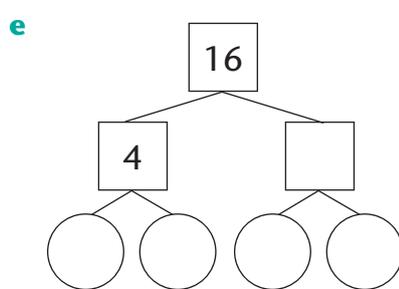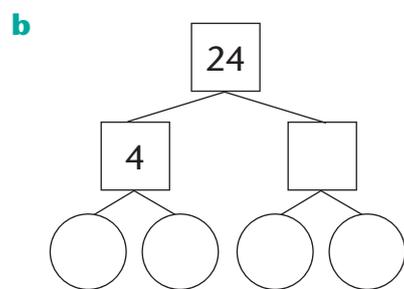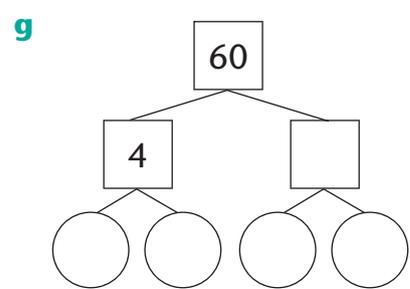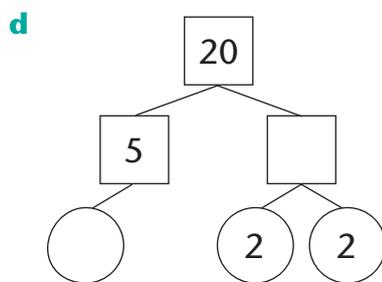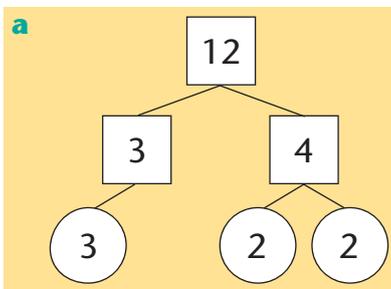
Prime numbers are numbers that have only themselves and 1 as factors.
For example: 2, 3, 5 and 7 are prime numbers but 4, 8 and 9 are not.
Composite numbers are numbers with more than two factors, e.g. 24 has factors of 1, 2, 3, 4, 6, 8, 12 and 24.

5 Write 'prime' or 'composite' after each number.

a 16 _____   **d** 27 _____   **g** 46 _____   **j** 45 _____

b 29 _____   **e** 24 _____   **h** 39 _____   **k** 37 _____

c 11 _____   **f** 38 _____   **i** 23 _____   **l** 81 _____

6 Apart from 1, is it possible for a squared number to be prime? Explain why.

_____

_____

7 Every composite number can be broken down into its prime factors.
Complete the factor trees to find the prime factors.

a

```
      12
     /  \
    3    4
    |   / \
    3  2   2
```

d

```
      20
     /  \
    5    □
    |   / \
    ○  2   2
```

g

```
        60
       /  \
      4    □
     / \  / \
    ○  ○ ○   ○
```

b

```
      24
     /  \
    4    □
   / \  / \
  ○  ○ ○   ○
```

e

```
      16
     /  \
    4    □
   / \  / \
  ○  ○ ○   ○
```

h

```
       48
      /  \
     □    12
    / \  / \
   ○  ○ ○   □
            / \
           ○   ○
```

c

```
      28
     /  \
    4    □
   / \   |
  ○  ○   ○
```

f

```
      44
     /  \
    4    □
   / \   |
  ○  ○   ○
```

i

```
        60
       /  \
      □    12
      |   / \
      ○  ○   □
             / \
            ○   ○
```

8 Multiply the prime factors on questions **a**, **b** and **c** in question 7.

a 3 × 2 × 2 = 12   **b** _____   **c** _____

9 Negative numbers can be easily displayed on a number line.

Complete the number line to −10 and +10.

$$-3 \quad -2 \quad -1 \quad 0 \quad 1 \quad 2 \quad 3 \quad 4$$
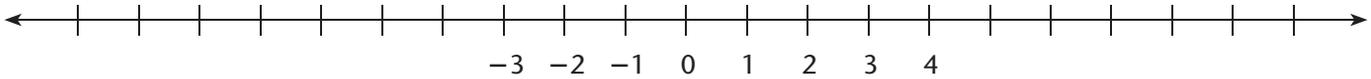
10 Solve the problem.

John stood on the landing which has been labelled step 0. He had to move up and down the steps as his sister gave him positive and negative numbers to follow. She said: +2, −3, +4, −5, +2 and −3. Put an X on the step where John finished.
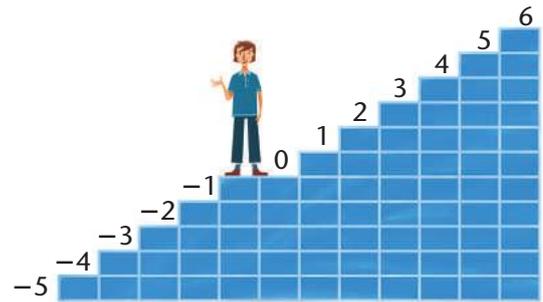
11 Answer the questions about the table.

a Which is the hottest city? _____

b Which is the coolest city? _____

c Which city has the greatest range of temperature between its high and low? _____

12 What is the difference between the highest and lowest temperatures of:
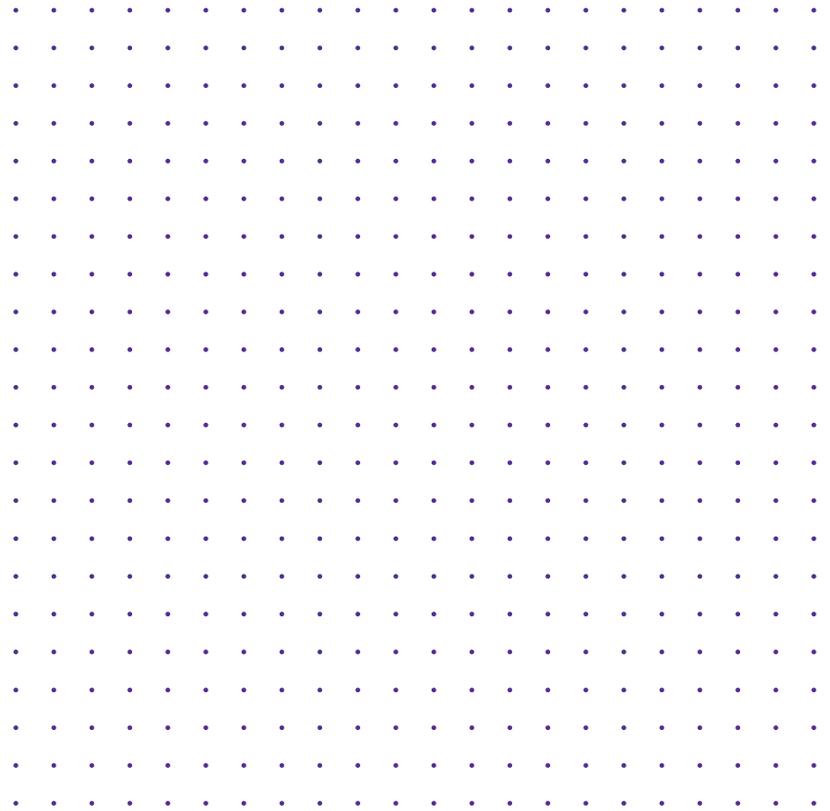
a Bangkok? _____

b Copenhagen? _____

c Montreal? _____

d Moscow? _____

e Sydney? _____

f Stockholm? _____

City	High	Low
Amsterdam	18°	4°
Bangkok	34°	27°
Berlin	10°	−5°
Chicago	14°	0°
Copenhagen	7°	−4°
Auckland	22°	16°
Sydney	25°	17°
Montreal	3°	−10°
New York	12°	−1°
Wellington	17°	14°
Moscow	10°	−2°
San Francisco	22°	8°
Stockholm	7°	−3°
Christchurch	15°	13°

°C 55° 50° 45° 40° 35° 30° 25° 20° 15° 10° 5° 0° −5° −10° −15° −20° −25°

13 What is the difference between the lowest temperatures of:
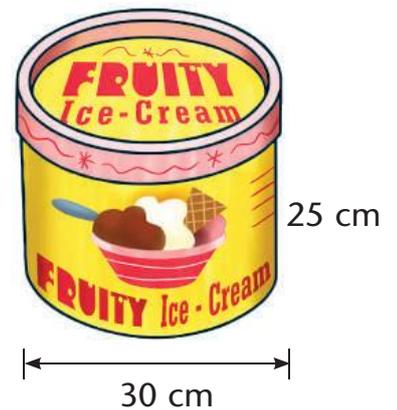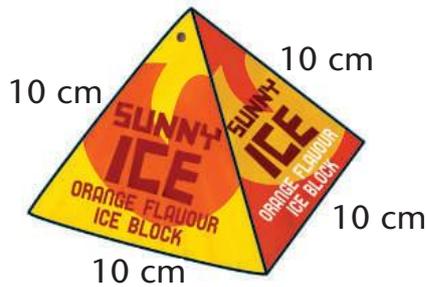
a Amsterdam and Bangkok? _____

b Berlin and Auckland? _____

c Copenhagen and San Francisco? _____

d Moscow and Christchurch? _____

126 Investigate everyday situations that use integers.
Locate and represent these numbers on a number line

Understanding
CCT N L

4 cm

10 cm

3 cm
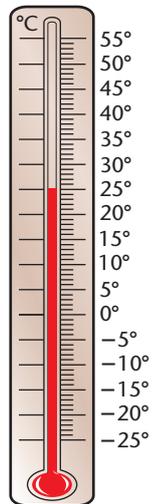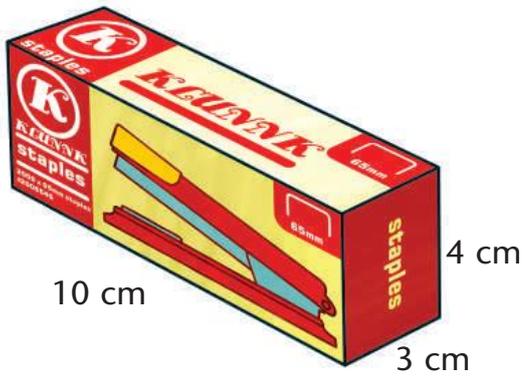
14 Use the scale 10 mm = 2 cm to design a net for the stapler box.

5 cm

15 cm

5 cm

10 cm

10 cm

10 cm

10 cm

25 cm

30 cm

15 Choose one of the objects above and sketch a net for it before constructing a congruent copy from cardboard and tape.

1 Complete these additions.

a
```
  3 4 . 5 6 7
  2 5 . 2 8 6
+ 3 1 . 2 5 4
```

b
```
  3 2 . 1 5 3
  5 2 . 8 8
+ 7 2 . 5 4 6
```

c
```
  9 . 9 0 1
  1 . 7 6 9 5
+ 4 . 8 3 2 5
```

d
```
  9 6 7 . 8 2
  3 4 7 . 6 5
+ 1 3 4 . 1 5
```

e
```
  5 6 . 7 8 9
  4 1 . 3
+ 3 1 . 2 1 5
```

f
```
  6 4 3 . 7 6
  2 9 5 . 1 9
+ 2 4 3 . 4 6
```

g
```
  7 1 5 . 2 8 4
  3 4 5 . 2 9 2
+ 2 6 7 . 2 4
```

h
```
  5 8 5 . 8 5 3
      4 . 0 9 2
+ 6 1 3 . 2 5 9
```

i
```
  5 6 3 2 . 8 7
  4 1 9 5 . 2 8
   3 2 5 . 0 0
+      6 . 1 6
```

j
```
  7 2 8 9 . 5 9
  4 1 3 2 . 1
   4 2 1 . 2 3
+    5 1 . 6 3
```

k
```
  5 2 8 . 8
  9 5 2 . 8 1 7
   3 5 . 6 2 7
+  4 1 . 5 0 6
```

l
```
  3 5 6 . 2 7 9
  4 1 3 . 2 2 6
  7 8 9 . 0 1
+ 4 2 5 . 6 1 7
```

2 Use the information given to calculate the area of each state and territory. Record your information on the map.
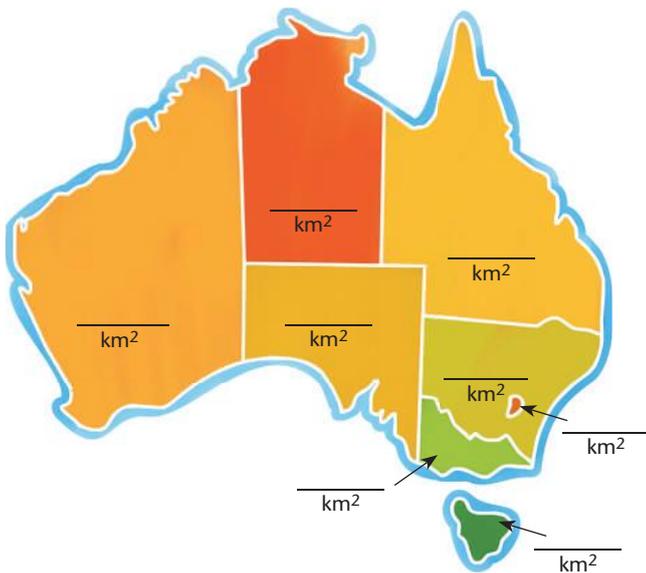
Area

- The ACT's area is 2000 km².
- Tasmania is 66 000 km² larger than the Australian Capital Territory.
- Victoria is 160 000 km² larger than Tasmania.
- New South Wales is 574 000 km² larger than Victoria.
- South Australia is 182 000 km² larger than New South Wales.
- Northern Territory is 362 000 km² larger than South Australia.
- Queensland is 381 000 km² larger than Northern Territory.
- Western Australia is 799 000 km² larger than Queensland.

3 Use your calculator to decide whether these statements are true or false.

a The total area of Australia is 7 683 000 km². _____

b Queensland is larger than the combined areas of New South Wales, Victoria, Tasmania and the Australian Capital Territory. _____

c New South Wales and South Australia, if combined, would be smaller than Queensland. _____

Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers

Fluency, Problem solving
L N

4 Write a rule for each number pattern, and then use it to predict the next two terms in the pattern.

You must look closely at the previous terms in the pattern.

Rule	Pattern						
a	97	95	93	91	89		
b	$\frac{1}{2}$	1	2	4	8		
c	$\frac{1}{4}$	$\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{3}{4}$	$2\frac{1}{4}$		
d	100	87	74	61	48		
e	17.5	18	18.5	19	19.5		
f	256	128	64	32	16		
g	3.7	4	4.3	4.6	4.9		
h	8	4	2	1	$\frac{1}{2}$		

5 Follow the rules to find the output of the machines.

a
Rule
× 3

Input
2.3
2.5
2.7
2.9

Output

b
Rule
× 4 ÷ 3

Input
3
6
9
12

Output
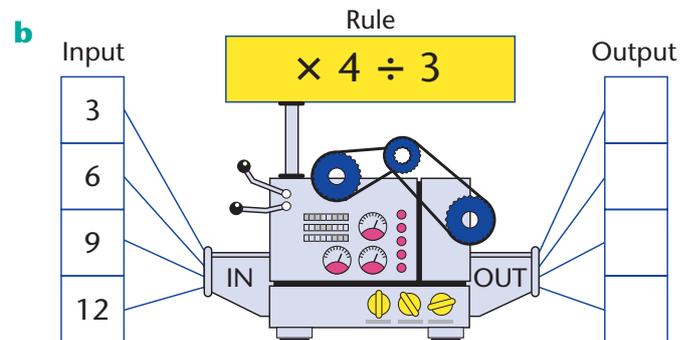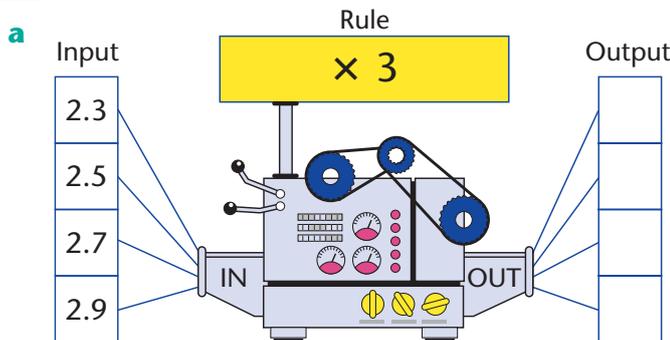
6 Follow the rules to complete the number sentences.

a Multiplication and addition

▲	1	2	3	4	5	6	7
●	3	5					

Rule ▲ × 2 + 1 = ●

b Multiplication and subtraction

▲	1	2	3	4	5	6	7
●							

Rule ▲ × 6 − 3 = ●

c Subtraction and division

▲	10	20	30	40	50	60	70
●							

Rule (▲ − 10) ÷ 5 = ●

d Multiplication and subtraction

▲	1	2	3	4	5	6	7
●							

Rule ▲ × 8 − 5 = ●

Understanding, Problem solving
CCT N

Continue and create sequences involving whole numbers, fractions and decimals.
Describe the rule used to create the sequence

129

How pie charts are used
Pie charts are circular graphs used to show how a total is divided.
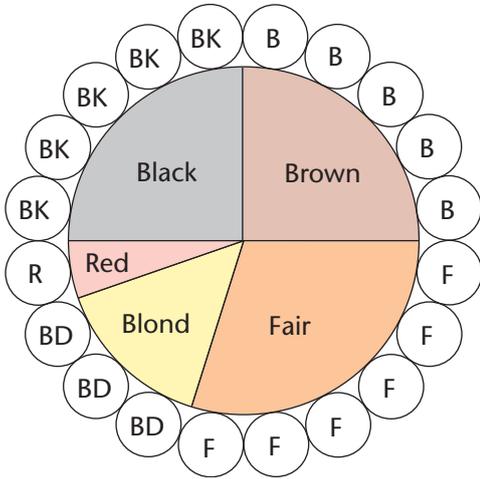
7 Owen's class made a pie chart of the hair colours of 20 students. The categories they used were:

| Brown (B) | Fair (F) | Blond (BD) | Red (R) | Black (BK) |

Give a fraction for each hair colour.

a Brown $\frac{5}{20}$ or $\frac{1}{4}$

b Blond _____

c Black _____

d Fair _____

e Red _____

8 **Making a pie chart in the playground**

a Make a pie chart, similar to the one above, of the hair colours of 20 students in your class. The students will need to be classified into hair colours and then stand shoulder to shoulder in a circle.

Students not involved in the survey can trace around the circle with chalk and mark off and label the sectors according to hair colour.

b On the blank pie chart, record the graph you made in the playground, labelling all the sectors and fractional parts.
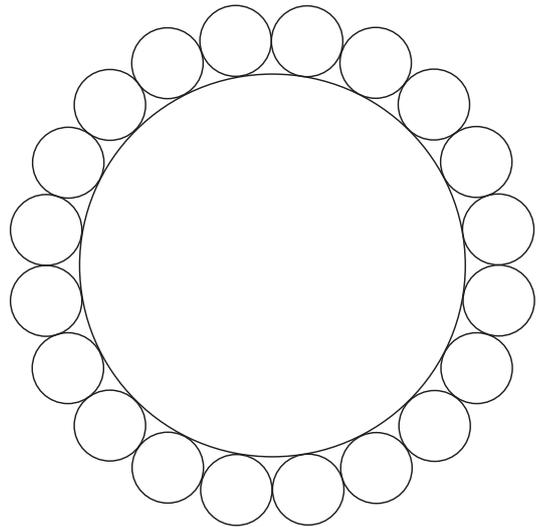
9 **Population of states and territories**

(For this exercise Australia's population has been rounded to 22 000 000.)

a Which 2 states have the largest populations?

_____

b Which territory has the smallest population?

_____

c Which state and territory are reasonably close in population?

_____

d Do you think that NSW has a population of over 4 000 000? _____

e What would you estimate Queensland's population to be? _____
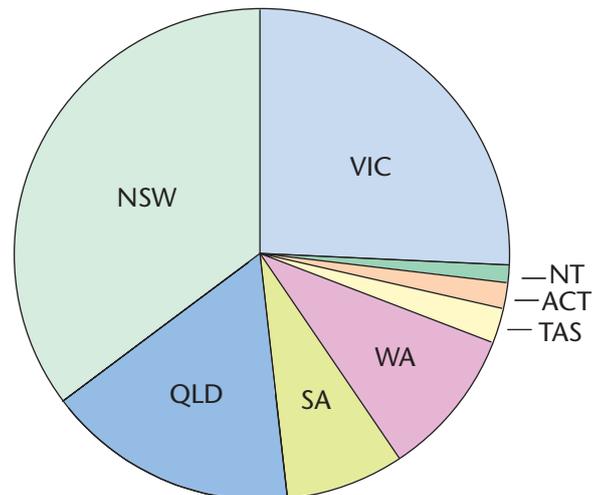
The amount a container can hold is its **capacity**.
The standard units of capacity are the litre (L),
millilitre (mL), kilolitre (kL) and megalitre (ML).

1000 mL = 1 litre
1000 L = 1 kL
1 000 000 L = 1 ML
1000 kL = 1 ML

10 Tick the box to describe the unit you would use to measure the capacity of each
item.

	millilitres	litres	kilolitres	megalitres
liquid paper				
laundry bucket				
coffee mug				
a dam				
backyard pool				
large soft drink				
rainwater tank				

The rainwater tank holds 3 kL.
3000 litres = 3 kilolitres

11 Convert these measurement into larger units.

a 5000 mL = _____ L

b 9000 L = _____ kL

c 4000 mL = _____ L

d 60 000 L = _____ kL

e 8000 kL = _____ ML

f 2 000 000 L = _____ ML

12 Use a calculator to convert between units. Some conversions will involve decimals.

a 86 000 L = _____ kL

b 4500 mL = _____ L

c 950 000 L = _____ kL

d 60 000 kL = _____ ML

e 5 500 000 L = _____ ML

f 120 000 L = _____ kL

g 9 900 000 L = _____ ML

h 2 000 000 mL = _____ L

13 Solve these problems.

a	A pool is being filled at a rate of 5000 litres per minute. How many kilolitres will the pool contain after 30 minutes?	
b	How many 5-L containers can be filled from a water reservoir holding 20 kilolitres?	
c	What is the difference in capacity between the community pool which holds 1 megalitre and our backyard pool which contains 90 000 litres?	

Multiplication problems

1 Solve the multiplications.

a	b	c	d	e
4 4 6	2 3 8	2 4 5	6 0 9	7 6 3
× 3 5	× 6 7	× 2 7	× 3 9	× 5 7

f	g	h	i	j
3 4 5	3 4 5	2 6 5	5 2 9	8 4 7
× 2 5	× 3 5	× 4 6	× 5 4	× 6 8

Modem   Fax   Printer   Computer   Copier

$89 $247 $358 $2560 $5460
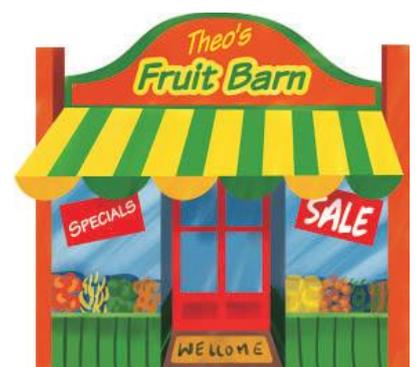
2 A large company is renewing their communications equipment. Use the distributive law or any other strategy you choose to find the cost of the purchases.

	Cost
a	81 workers are to receive a modem only.	
b	21 of the workers are to receive a modem and a computer.	
c	9 people are to receive a computer and a fax machine.	
d	12 people are to receive a computer and a printer.	
e	18 copiers are to be bought.	

3 Check the rent for each shop by rounding both the rent amount and the weeks to make an estimate. Put a tick if you think the rent is correct and a cross if you don't.

	Shop	Rent	Weeks	Estimate	Rent	✗ or ✓
a	Fruit	$398	19		$5562	
b	Baker	$307	39		$11 973	
c	Cafe	$412	32		$13 184	

Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers
Problem solving, Understanding
CCT N

4 Find the correct answer by substituting the given numbers into the number sentences.

a	$32 \div \square = 8$	3	4	5	6
b	$39 \div \square = 13$	2	4	5	3
c	$20 \div \square + 12 = 17$	3	5	4	2
d	$25 \times \square + 25 = 150$	2	4	5	6
e	$\square \div 3 + 10 = 40$	80	90	60	50
f	$5 \times \square \times 4 = 100$	3	4	5	6
g	$\frac{1}{4} \times 20 = \square \times 15$	$\frac{1}{8}$	$\frac{1}{3}$	$\frac{1}{4}$	$\frac{1}{6}$
h	$2 \times \square \times 3 \times 4 = 48$	4	3	2	1

> $3 \times \square + 6 = 30$
> I tried 6 and 7 before finding the answer of 8.

5 Find the matching card to balance the scales.

a $35 + 15$ [ ]

b $100 - 75$ [ ]

c $200 - 75$ [ ]

d 35×5 [ ]

e $99 \div 3$ [ ]

$100 - 77$
$75 \div 3$
$30 - 6$
2×25
21×4
$150 - 25$
$57 - 24$
25×7
$17 + 30$
$90 - 9$

f $96 \div 4$ [ ]

g 27×3 [ ]

h $69 \div 3$ [ ]

i $47 + 37$ [ ]

j $93 - 46$ [ ]

Backyard cricket rules
- Can't get out first ball
- On the roof = 8 and out
- Over the fence = 6
- All other shots = 1
- Hit the fence = 4
- Caught by the dog = out

6 Complete the equations to show how many runs each player scored in a game of backyard cricket.

	Player	Equation	Total score
a	Lee	$5 \times \square + 6$	26
b	Gina	$3 \times \square + 4 + 8$	30
c	Melody	$3 \times 4 + 1 + \square$	21
d	Jesse	$10 \times 6 + 10 \times \square + 8$	108
e	Costa	$2 \times \square + 2 + 2 + 2$	18

Data presented in graphs and charts can be misleading.
It may be true but its appearance may give a false impression.

Muscles Gym Membership – Graph A

Muscles Gym Membership – Graph B
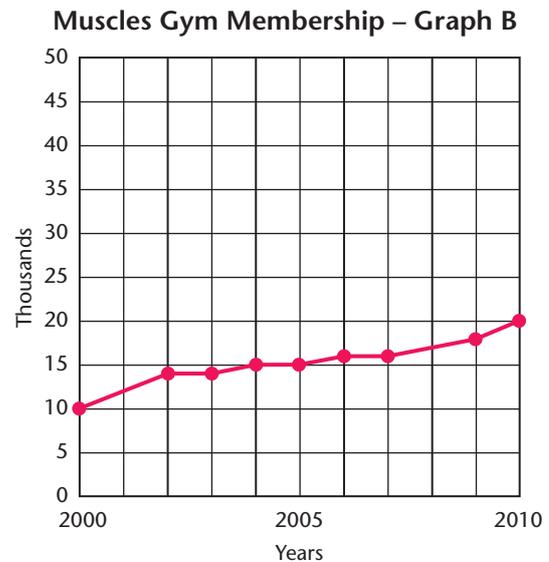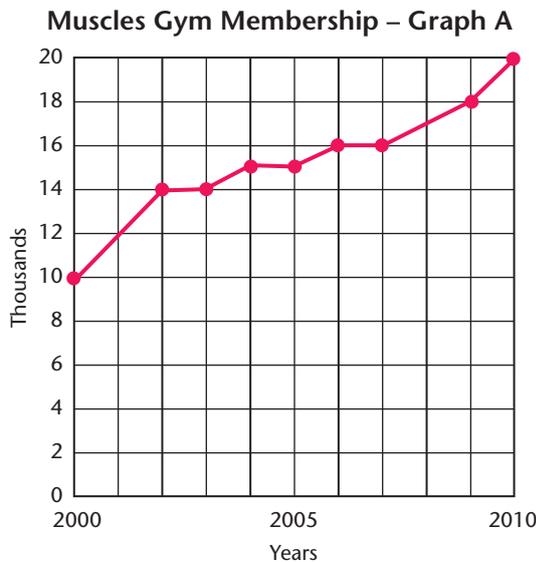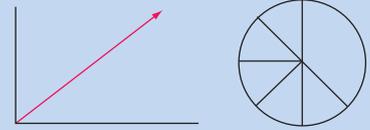
7 Compare the two graphs to see if the statements are true or false.

		True or false
a	Graph A gives the impression that membership has increased considerably over 10 years.	
b	Graph B shows the same data but the increase appears less significant.	
c	Graph A indicates that gym membership is full.	

8 Shannon noticed two articles about computers in the newspaper. Use all the information to answer the questions below.

Computer Prices Tumble

The manager of *Switched on Computers* said he has never seen prices so low: 'This graph shows that prices are falling rapidly'.

Price of XL5100 Computer
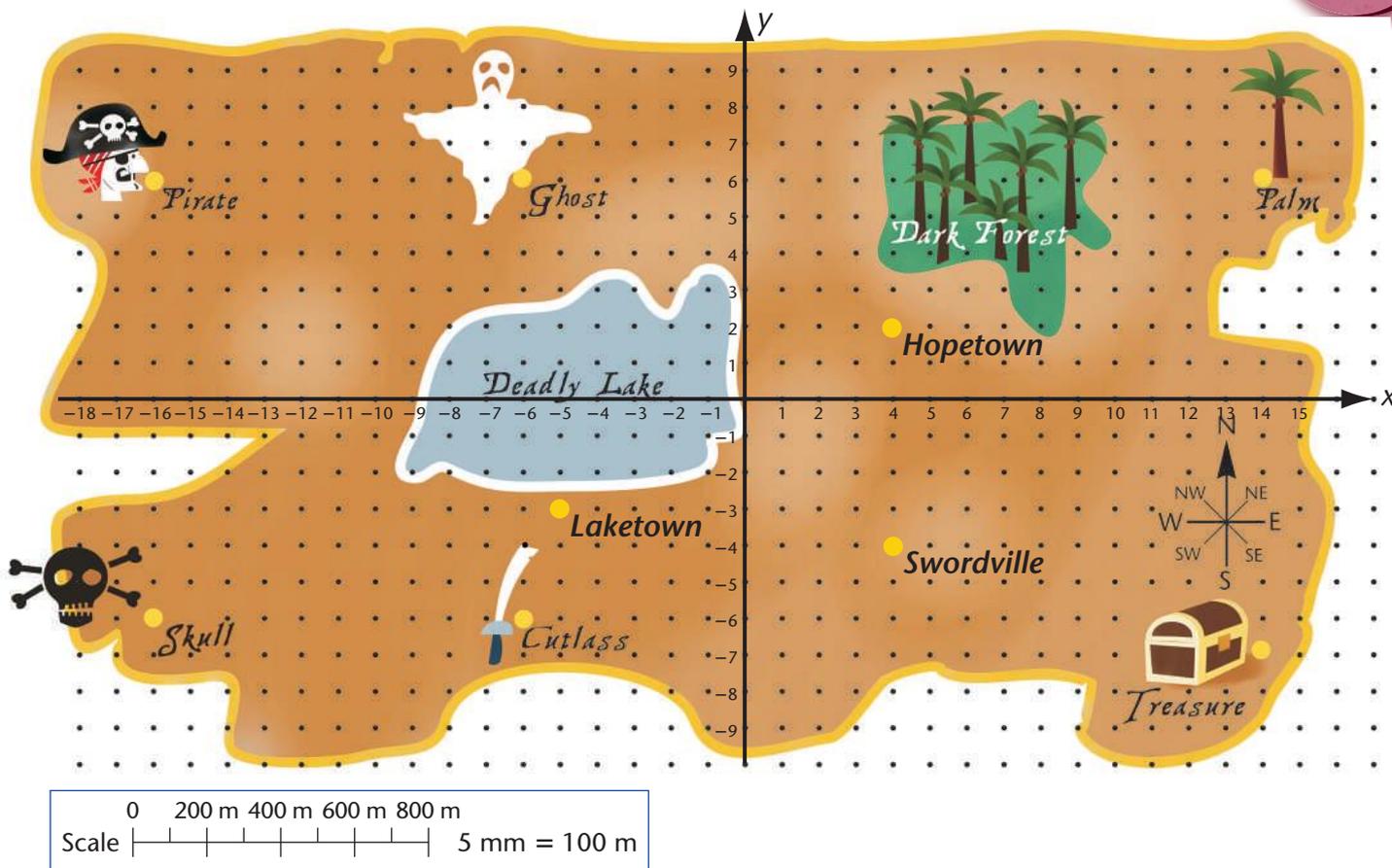
a By how much did the price actually fall in six months?

_____

Yobisha deletes XL5100
Ms Kim Kyoo of Yobisha Computers recently announced that the XL5100 computer would no longer be produced as it was being replaced by the XL6100.

b Explain why this graph would not accurately represent the price of all computers. _____

_____

c Explain why the word 'tumble' is misleading. _____

9 Challenge: Search newspapers, magazines or other media sources to find examples of misleading data. Explain your reasons for describing it as misleading.

```
0    200 m 400 m 600 m 800 m
Scale ├─┼─┼─┼─┼─┼─┼─┼─┤  5 mm = 100 m
```

10 What town can be found at these ordered pairs? (Remember to always read the *x*-axis first.)

a (14, 6) _____

b (−6, 6) _____

c (14, −7) _____

d (−16, 6) _____

e (−16, −6,) _____

11 Give the coordinate points for the following towns.

a Hopetown _____

b Laketown _____

c Swordville _____

12 Join these sets of coordinates to make shapes on the Cartesian plane.

a (1, 1) (5, 1) (3, 3)

b (−2, 3) (−2, 5) (2, 3) (2, 5)
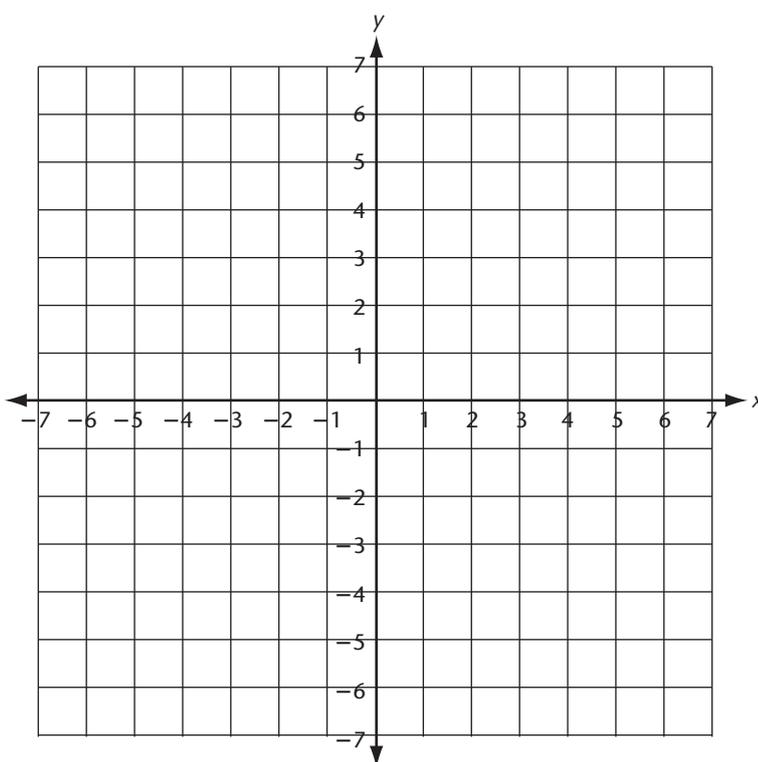
c (−7, 0) (−4, 0) (−5, 7)

d (−3, −2) (−3, 2) (−1, −2) (−1, 2)

e (1, 0) (4, 0) (1, −3)

f (2, −3) (2, −5) (7, −3) (7, −5)

g (−4, −4) (−6, −5) (−2, −5)
(−5, −7) (−3, −7)

Decimals × powers of ten

1 Use your calculator to answer these questions.

a 0.452 × 10 ▢ **b** 0.452 × 100 ▢ **c** 0.452 × 1000 ▢

d 8.46 × 10 ▢ **e** 8.46 × 100 ▢ **f** 8.46 × 1000 ▢

2 Predict the answers to these and then check with a classmate.

a 23.1 × 10 ▢ **b** 23.1 × 100 ▢ **c** 23.1 × 1000 ▢

d What happened to the numbers when they were multiplied by 10?

_____

e What happened when they were multiplied by 100?

_____

f What happened when they were multiplied by 1000?

_____

3 Use your calculator to answer these questions.

a 4.52 ÷ 10 ▢ **b** 4.52 ÷ 100 ▢ **c** 4.52 ÷ 1000 ▢

d 8.46 ÷ 10 ▢ **e** 8.46 ÷ 100 ▢ **f** 8.46 ÷ 1000 ▢

4 Predict the answers to these and then check with a classmate.

a 23.1 ÷ 10 ▢ **b** 23.1 ÷ 100 ▢ **c** 23.1 ÷ 1000 ▢

d What happened to the numbers when they were divided by 10?

_____

e What happened when they were divided by 100?

_____

f What happened when they were divided by 1000?

_____

5 Multiply these numbers mentally.
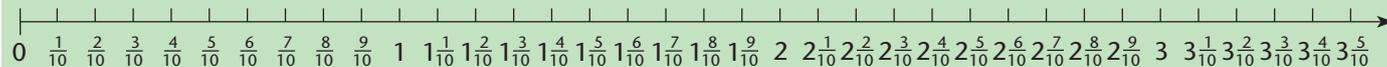
a 0.374 × 10 = **b** 3.356 × 10 = **c** 0.874 × 100 =

d 8.256 × 100 = **e** 3.674 × 1000 = **f** 5.296 × 1000 =

6 Write a number with 3 decimal places then multiply it by 10, 100 and 1000.

Multiply and divide decimals by powers of 10

Fluency, Reasoning
N CCT

7 Use the number line to help you continue these sequences.

Number line: 0, $\frac{1}{10}$, $\frac{2}{10}$, $\frac{3}{10}$, $\frac{4}{10}$, $\frac{5}{10}$, $\frac{6}{10}$, $\frac{7}{10}$, $\frac{8}{10}$, $\frac{9}{10}$, 1, $1\frac{1}{10}$, $1\frac{2}{10}$, $1\frac{3}{10}$, $1\frac{4}{10}$, $1\frac{5}{10}$, $1\frac{6}{10}$, $1\frac{7}{10}$, $1\frac{8}{10}$, $1\frac{9}{10}$, 2, $2\frac{1}{10}$, $2\frac{2}{10}$, $2\frac{3}{10}$, $2\frac{4}{10}$, $2\frac{5}{10}$, $2\frac{6}{10}$, $2\frac{7}{10}$, $2\frac{8}{10}$, $2\frac{9}{10}$, 3, $3\frac{1}{10}$, $3\frac{2}{10}$, $3\frac{3}{10}$, $3\frac{4}{10}$, $3\frac{5}{10}$

a | 0 | $\frac{3}{10}$ | $\frac{6}{10}$ | $\frac{9}{10}$ | | | |

b | 1 | $1\frac{2}{10}$ | $1\frac{4}{10}$ | $1\frac{6}{10}$ | | | |

c | 0 | $\frac{4}{10}$ | $\frac{8}{10}$ | $1\frac{2}{10}$ | | | |

d | $1\frac{2}{10}$ | $1\frac{4}{10}$ | $1\frac{6}{10}$ | $1\frac{8}{10}$ | | | |

e | $\frac{6}{10}$ | 1 | $1\frac{4}{10}$ | $1\frac{8}{10}$ | | | |

f | $3\frac{5}{10}$ | $3\frac{2}{10}$ | $2\frac{9}{10}$ | $2\frac{6}{10}$ | | | |

8 Use the number line of decimals to help you continue these sequences.

Number line: 0, 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1, 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 2, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9, 3, 3.1, 3.2, 3.3, 3.4, 3.5

a | 0 | 0.3 | 0.6 | 0.9 | | | |

b | 0 | 0.4 | 0.8 | 1.2 | | | |

c | 0 | 0.06 | 0.12 | 0.18 | | | |

d | 1.1 | 1.3 | 1.5 | 1.7 | | | |

e | 3 | 2.5 | 2 | 1.5 | | | |

f | 3.5 | 3.1 | 2.7 | 2.3 | | | |

9 Continue the sequences.

a | 0.11 | 0.14 | 0.17 | 0.2 | | | |

b | 0.31 | 0.35 | 0.39 | 0.43 | | | |

c | 0.07 | 0.11 | 0.15 | 0.19 | | | |

d | 6.37 | 6.42 | 6.47 | 6.52 | | | |

e | 0.03 | 0.09 | 0.15 | 0.21 | | | |

f | $1\frac{1}{6}$ | $1\frac{3}{6}$ | $1\frac{5}{6}$ | $2\frac{1}{6}$ | | | |

g | 2 | $2\frac{2}{3}$ | $3\frac{1}{3}$ | 4 | | | |

h | 3 | $3\frac{3}{4}$ | $4\frac{1}{2}$ | $5\frac{1}{4}$ | | | |

i | 4 | $4\frac{3}{8}$ | $4\frac{6}{8}$ | $5\frac{1}{8}$ | | | |

j | 5 | $5\frac{5}{12}$ | $5\frac{10}{12}$ | $6\frac{3}{12}$ | | | |

Understanding, Reasoning
L N CCT

Continue and create sequences involving whole numbers, fractions and decimals.
Describe the rule used to create the sequence

137

The four graphs below represent the same information. They show how a weekly family income of $1200 is spent.

Dot plot

● = $50

Tax   Food   Mortgage   Clothing   Bills   Entertainment

Pie chart

Mortgage, Entertainment, Bills, Clothing, Food, Tax

Column graph

500
400
300
200
100
0

Tax   Food   Mortgage   Clothing   Bills   Entertainment

Picture graph

$100s of dollars

Key [$] = $100

Tax   Food   Mortgage   Clothing   Bills   Entertainment
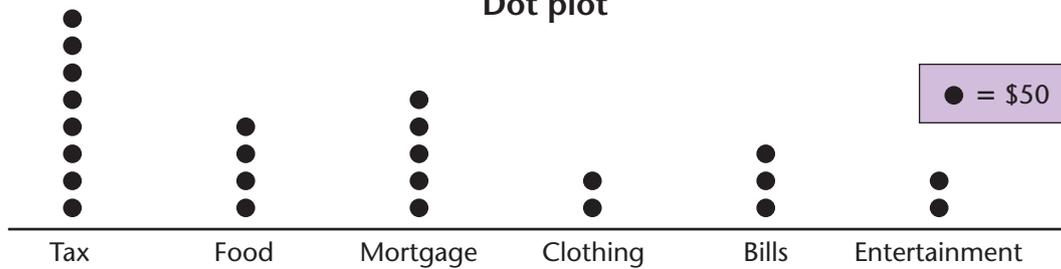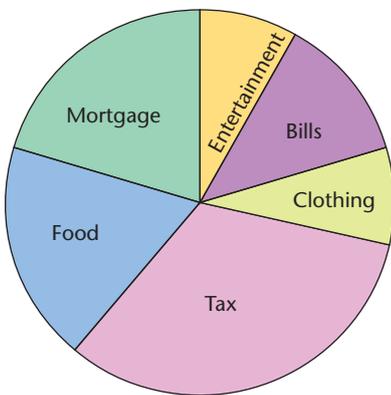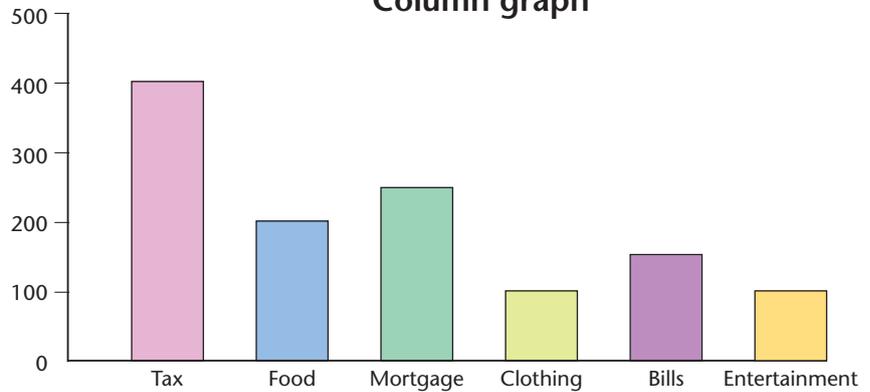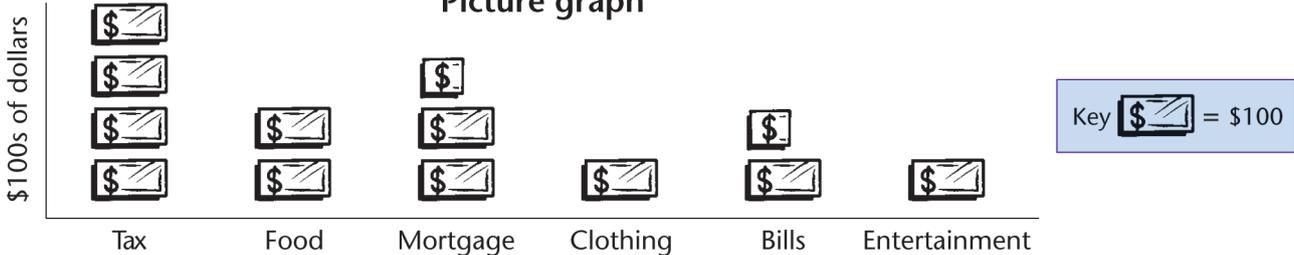
10 Answer these questions.

a Which graph do you think is good for an overall picture of the amounts spent?

_____

b Which graph is best for quickly reading off accurate amounts? _____

c Which other graph can be used to read off reasonably accurate amounts? _____

d Can accurate amounts be read from the pie chart? _____

e Which graph or graphs would be best for showing how a total is divided?

_____

11 Give examples of where each type of graph could be useful in presenting data.

a Column graph	**c** Dot plot graph
b Picture graph	**d** Pie chart

Surveys are used to gather information.
A survey may involve the entire **population** or only a **sample**.
Example: **Population** – The whole group such as every student in a school.
Sample – A random selection taken from the population such as five students from every class in the school.

Three girls in Sophie's netball team are left-handed. Based on this small survey, Sophie says that 30% of all the people are left-handed.

12 Conduct a survey of your class to find out how many are right- and left-handed.

a **Sample group**
Use your class as the sample group.
Tally and record the data below.

Hand	Tally
Left	
Right	

b Record your data as a fraction.

c Record your data as a percentage.

%

Calculator steps: numerator ÷ denominator %

13 If possible, and on a separate piece of paper, conduct a survey of your whole school population to find out how many are left-handed. This could be done quickly with a raise of hands in classes for left-handers and the class teacher giving you the total number of children in the class.

a

Total school population	Left-handed children	Fraction of left-handers	Percentage of left-handers

b What was wrong with Sophie's survey of the netball team? _____

14 **a** If you increase the size of your data sample will it become more accurate? _____

b Recently a group of 20 children at a hamburger restaurant were surveyed by the owners of the restaurant. The owner found that the favourite food was hamburgers.
Is this a reasonable survey for the whole country? _____

Explain why. _____

Finding percentages

A simple way of finding **percentages** of quantities is to convert the percentage to a fraction.

E.g. 20% of $20 becomes $\frac{1}{5}$ of $20 = $4

1 Find the percentages of each quantity.
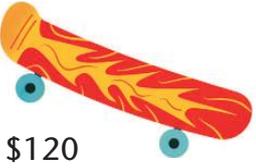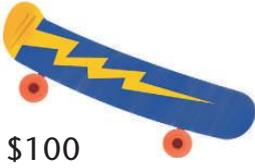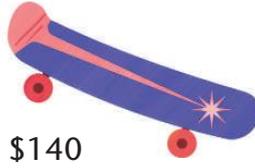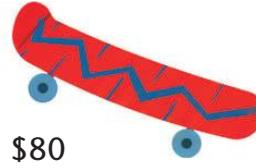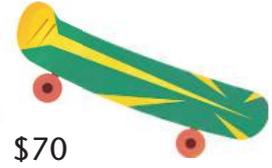
a 10% of 20 pigs = _____

b 20% of 50 dogs = _____

c 50% of 40 cats = _____

d 25% of $40 = _____

e 20% of 20 pens = _____

f 10% of 50 goats = _____

g 50% of 32 biros = _____

h 10% of $60 = _____

i 50% of 80 birds = _____

j 20% of 60 kangaroos = _____

k 25% of $200 = _____

l 20% of $200 = _____

2 Convert each percentage to a fraction to calculate the discount.

Example: | 10% of $20 | = | $\frac{1}{10}$ of $20 |

a $20 — Less 10%

b $10 — Less 20%

c $48 — Less 25%

d $76 — Less 50%

e $6 — Less 10%

f $30 — Less 20%

g $2 — Less 25%

	Cost	Discount	Discounted cost
a	$20	$2	$18
b			
c			
d			
e			
f			
g			

Razor	Zapper	Lazer	Crusher	Splinter
$120	$100	$140	$80	$70
25% off	20% off	50% off	25% off	20% off

3 Answer the questions.

a Which would be the cheapest skateboard? _____

b Which would be the most expensive? _____

c Which skateboard would cost $80? _____

d Which skateboard would cost $70? _____

Investigate and calculate percentage discounts of 10%, 25% and 50% on sale items, with and without digital technologies

Fluency, Problem solving
N PSC L

Around the world

Planning a trip overseas can be difficult, especially when it is time to plan your budget for the money you will need in each country. Imagine you are about to go on a trip that will take you to New Zealand, Canada, USA, France, Fiji and Singapore. You will need to know the exchange rates listed below.

$1.21
New Zealand
Dollars

Exchange rates

€0.56
Euros
(France)

$0.88
Canadian
Dollars
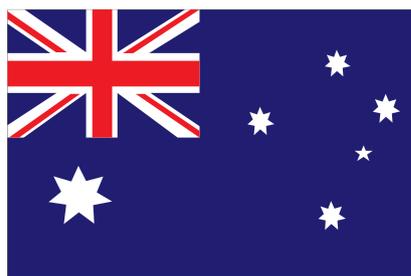
$1.20
Fijian
Dollars

$0.87
American
Dollars

$1 Australian buys …

$1.06
Singaporean
Dollars

Your travel agent helped you work out how much money you might need in each country's currency.

| New Zealand | **NZ$410.00** | France | **€807** | Canada | **C$1000.00** |
| Fiji | **FJ$285.00** | USA | **US$1200.00** | Singapore | **S$910.00** |

4 Use your calculator to convert these amounts as closely as possible into Australian dollars (A$). Round your answers to the second decimal point to match our currency. You will need to divide the amount of currency needed by the exchange rate listed for that country. The first one is done for you.

	Currency	Amount ÷ exchange rate	A$
a	New Zealand	NZ$410 ÷ 1.21 =	A$338.84
b	Canada		
c	USA		
d	France		
e	Fiji		
f	Singapore		
g	Total		

The exchange rate is the rate at which one currency can be exchanged for another.

5 Solve these problems.

| a | When Stuart returned from his rugby tour of Fiji he had $51 Fijian left over. How many Australian dollars is this equal to? | |
| b | Maddison bought a flag while she was away and paid $55 Canadian for it. How much is this in Australian dollars? | |

Problem solving, Fluency
N PSC

Multiply decimals by whole numbers and perform divisions by non-zero whole numbers where the results are terminating decimals, with and without digital technologies

141

| Legend | ● Town | ━━━ Road | - - - - - Walking path | +++++++ Railway |
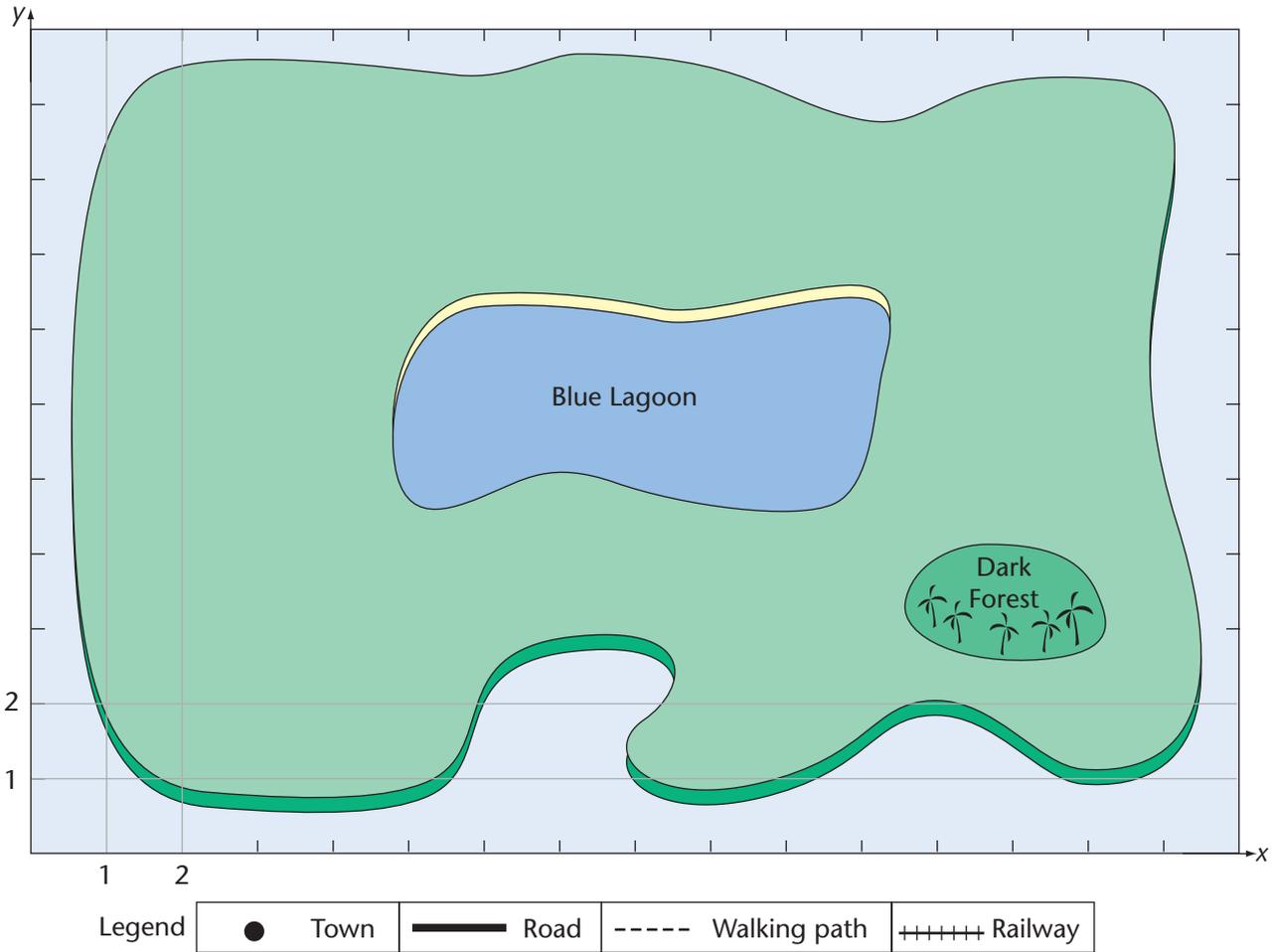
6 Draw vertical and horizontal lines to make ordered pair reference points on the map. Use the marks that have been supplied. It has been started for you.

7 Finish labelling the *x*-axis 1 to 16 and the *y*-axis 1 to 11 on the map.

8 Use the legend and the grid reference points you have made to put these towns on the map and label them.

a Mushroom (2,1)   **c** Pumpkin (8,9)   **e** Bean (14,2)   **g** Apple (9,4)

b Spud (2,9)   **d** Carrot (14,9)   **f** Banana (9,2)   **h** Orange (6,4)

9 Draw these paths on the map.

a Draw a road to join Mushroom and Pumpkin via Spud.

b Draw a railway link between Pumpkin and Carrot.

c Draw a walking path between Carrot and Bean.

d Draw a road between Bean and Mushroom via Banana, Apple and Orange.

10 Design a scale for this map and then measure the distance between these destinations in a straight line.

Scale _____

a Apple and Orange _____   **b** Spud and Carrot _____   **c** Mushroom and Orange _____

Cubic metres are needed to measure the volume of larger objects.
A cube whose edges are all 1 metre long has a volume of 1 cubic metre. (1 m^3)

2 m
1 m

1 m
1 m
1 m
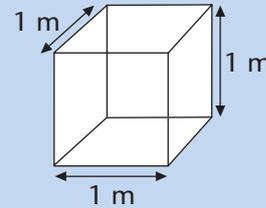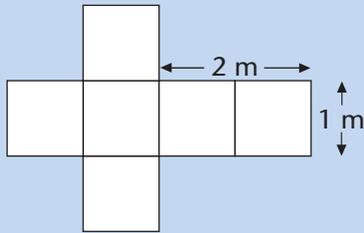
11 Decide whether these objects are less than 1 m^3, about equal to 1 m^3 or greater than 1 m^3.
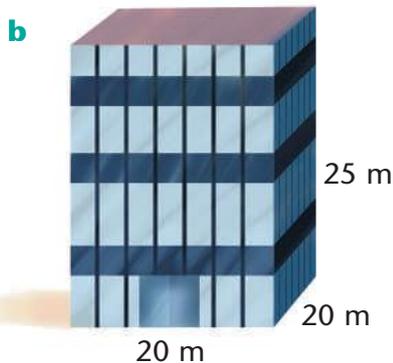
A telephone box is about 2 m^3.
$2 \text{ m} \times 1 \text{ m} \times 1 \text{ m} = 2 \text{ m}^3$

	Less than 1 m^3	About 1 m^3	More than 1 m^3
Tent			
Classroom			
Milk crate			
Toddler's pool			
Cubbyhouse			
Fruit box			
Refrigerator			
TV set			
Chalk box			
Barbecue			

12 Use the formula **Length × Width × Height = Volume** to calculate the volume of each building in m^3.

a

6 m
10 m
4 m

Volume = m^3

b

25 m
20 m
20 m

Volume = m^3

c

40 m
30 m
40 m
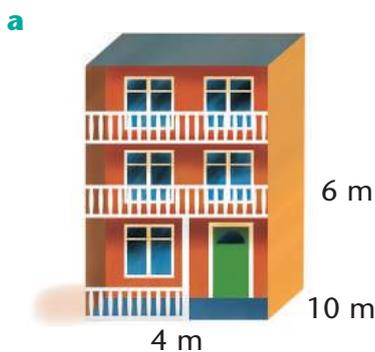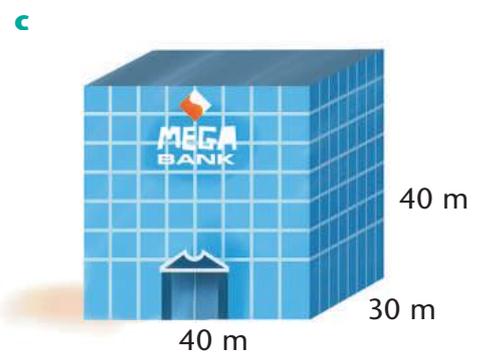
Volume = m^3

13 How many 50 cm × 50 cm × 50 cm boxes would fit inside a cubic metre? _____

Recurring decimals

1 Change these fractions into decimals by dividing the numerator by the denominator.

> Numerator $\dfrac{1}{4} = \mathbf{0.25}$
> Denominator

a $\dfrac{1}{2} =$ _____

b $\dfrac{1}{4} =$ _____

c $\dfrac{1}{8} =$ _____

d $\dfrac{3}{4} =$ _____

e $\dfrac{3}{8} =$ _____

f $\dfrac{7}{8} =$ _____

g $\dfrac{5}{8} =$ _____

h $\dfrac{1}{5} =$ _____

i $\dfrac{3}{5} =$ _____

j $\dfrac{4}{5} =$ _____

k $\dfrac{10}{16} =$ _____

l $\dfrac{9}{10} =$ _____

2 Change these fractions into decimals. You will notice that the decimal recurs. In cases like this you place a dot over the first decimal that is recurring.

> $\dfrac{1}{3} = \mathbf{0.3333333333333333}$
> This becomes $\mathbf{0.3\dot{}}$
>
> $\dfrac{5}{12} = \mathbf{0.4166666666666666}$
> This becomes $\mathbf{0.41\dot{6}}$

a $\dfrac{2}{3} =$ _____

b $\dfrac{1}{6} =$ _____

c $\dfrac{5}{6} =$ _____

d $\dfrac{2}{6} =$ _____

e $\dfrac{1}{9} =$ _____

f $\dfrac{4}{9} =$ _____

g $\dfrac{7}{12} =$ _____

h $\dfrac{11}{12} =$ _____

> $\dfrac{7}{12} = 0.58\dot{3}$
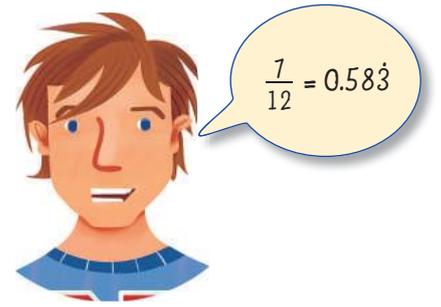
3 Complete these divisions giving your answers as recurring decimals.

a $3\,|\,4\ 7$

b $3\,|\,9\ 4\ 3$

c $3\,|\,1\ 2\ 8$

d $6\,|\,1\ 2\ 3\ 5$

e $6\,|\,3\ 5\ 7\ 7$

f $6\,|\,1\ 4\ 0\ 5$

g $6\,|\,2\ 1\ 4\ 3$

h $9\,|\,1\ 9\ 4\ 5$

i $9\,|\,2\ 1\ 1\ 6$

j $9\,|\,2\ 1\ 9\ 5$

k $9\,|\,3\ 2\ 1\ 4$

l $6\,|\,2\ 1\ 4\ 7$

Below are 3 basic ways to answer a division question.

A	Answer it with a remainder. E.g. 6r1
B	Answer it with a fractional remainder. E.g. $6\frac{1}{3}$
C	Answer it with a decimal/recurring decimal remainder. E.g. $6.\dot{3}$

4 Choose the best way to answer the divisions below. Answer A, B or C.

a A farmer wants to share 97 sheep between 6 paddocks. ☐

b 9 pies are shared among 4 children. ☐

c 3 people are given $1708.20 to share equally. ☐

Order of operations

Remember! Multiplication and division are done **before** addition and subtraction.

5 Solve these equations.

$15 + 21 \div 3 =$ ☐ $15 + 7 = 22$

a $15 + 21 \div 3 =$ _____

b $5 + 20 \times 4 =$ _____

c $8 \times 5 \div 4 =$ _____

d $3.5 \times 2 - 4 =$ _____

e $0.5 + 2.5 \times 4 =$ _____

f $36 \div 4 + 54 =$ _____

g $30 \times 5 \div 10 =$ _____

21 divided by 3 has to be done first.

6 Use your own strategies to find the missing numbers.

a $3 \times 8 \div$ ☐ $+ 1 = 7$

b $105 - 100 \div$ ☐ $= 80$

c $45 \div$ ☐ $\times 6 = 30$

d $4 \times$ ☐ $\div 3 = 28$

e $\frac{1}{5} \times ($ ☐ $+ 3) + 6 = 9$

f ☐ $\times \frac{1}{6} + 97 = 100$

I estimate the answer then I check to see if my estimate works.

7 **The builder's kit**

Costs: timber strips $1.80, hammers $7.80, scissors $3.50, cuphooks 35c, ruler $1.20, mixed nails $2.50 and mixed screws $2.50.

a Which number sentence is correct for the costs of the timber strips and cuphooks needed to hang the items in the diagram above?

☐ $10 \times \$1.80 + 2 \times 35c$

☐ $\$1.20 \times 2 + 10 \times 35c$

☐ $10 \times 35c + 2 \times \$1.80$

b Which number sentence is correct for the cost of the hammers, nails, screws, cuphooks and timber strips?

☐ $5 \times \$3.50 + 2 \times \$2.50 + 10 \times 35c$

☐ $5 \times \$7.80 + 3 \times \$1.20 + 2 \times \$1.80 + 10 \times 35c$

☐ $3 \times \$7.80 + 2 \times \$2.50 + 2 \times \$1.80 + 10 \times 35c$

☐ $3 \times \$3.50 + 3 \times \$7.80 + 2 \times \$1.80 + 10 \times 35c$

Telephone call rates
- Local calls 22c per minute
- Overseas calls $1.10 per minute
- Interstate calls 50c per minute
- Late night calls (11 pm to 2 am) 5c per minute

8 Create your own equations using brackets to work out the cost of these 1-minute phone calls.

	Name	Calls	Equation	Solution
a	Bob	25 local calls 3 overseas calls 9 interstate calls		
b	Eve	15 interstate calls 8 overseas calls 30 local calls		
c	Anna	22 overseas calls 39 late night calls 1 interstate call		

Data exploration

9 The table below shows the amount of pocket money 99 young people earned doing various odd jobs.

$4	$50	$20	$2	$4	$8	$2	$4	$2	$5	$15	$4	$5	$5	$5
$2	$10	$8	$8	$8	$8	$2	$25	$2	$5	$10	$4	$10	$2	$4
$8	$8	$10	$15	$2	$20	$2	$5	$2	$5	$15	$10	$10	$2	$10
$20	$4	$10	$10	$10	$15	$2	$5	$15	$2	$2	$20	$10	$2	$10
$5	$10	$8	$8	$10	$15	$2	$5	$4	$2	$2	$8	$8	$10	$10
$5	$10	$8	$8	$15	$10	$8	$8	$25	$2	$2	$15	$4	$15	$10
$5	$20	$5	$5	$5	$15	$10	$10	$4						

Display this data on the frequency table below so that it can be interpreted easily. It has been started for you.

Amount	Tally	Frequency
$2	|||| |||| |||| ||||	20
$4		
$5		
$8		
$10		
$15		
$20		
$25		
$50		

I do chores for my pocket money.

10 Represent this data on a dot plot.

$0　　$2　　$4　　$5　　$8　　$10　　$15　　$20　　$25　　$50

11 Which amounts represent the mode and median amounts of pocket money received?

a mode _____   **b** median _____

12 Experiment 1— What is the mass of 1 litre of water?

Materials
- Kitchen scales
- Jug
- Litre of water

Follow the instructions.

a Place the empty jug on the scales and measure its mass. _____

b Fill the jug with 1 litre of water and measure its mass. _____

c Subtract the mass of the jug. _____

d **Result:** One litre of water has a mass of ☐ kilogram.

13 Experiment 2 — What is the mass of 1 millilitre of water?

Materials
- Plastic bottle
- Water
- Balance scales

Follow the instructions.

a Measure the mass of the empty plastic bottle. _____

b Pour 50 mL of water into the bottle and record the mass. _____

c Calculate the mass of the water by subtracting the mass of the bottle. _____

d Repeat this for 100 mL, 250 mL, 500 mL. Record your results in the chart.

Quantity	50 mL	100 mL	250 mL	500 mL
Mass	g	g	g	g

Result: One millilitre of water has a mass of ☐ gram.

14 Research at home or at school to find the mass of containers holding these volumes of liquids.

Volume of liquid	Mass
a 2-litre bottle of orange juice	
b 1.25-litre bottle of lemonade	
c 600-millilitre carton of milk	

Diagnostic review 4

PART 1

Solve these problems.

a Scott worked 3 weeks during the holidays and was paid $275 per week. How much did he earn over this period?

b Six fence panels each 375 centimetres long were placed along the back fence. What is the total length of the fence?

c Dad's return trip to work each day is 183 km. How far would he drive in a normal 5-day week?

PART 2

200 jelly beans are in a jar. How many of each colour are:

a Green: 10% _____

b Red: 0.2 _____

c White: $\frac{1}{10}$ _____

d Blue: 25% _____

e Yellow: 0.25 _____

f Black: 0.1 _____

PART 3

Calculate the price of each wetsuit after subtracting the discount.

a $160

b $200

c $120

less 25%

less 50%

less 10%

$ 1 6 0
−
$

$ 2 0 0
−
$

$ 1 2 0
−
$

PART 4

Continue the number pattern.

a

1.32	1.36	1.40			

PART 5

Use mental strategies to complete these operations.

		× 10	× 100	× 1000
a	0.528			
b	2.259			
c	0.456			
d	6.707			

		÷ 10	÷ 100	÷ 1000
e	958.00			
f	675.25			
g	999.99			
h	676.75			

i If 10 lengths of chain each 4.25 metres long were joined together, how long would the chain be? _____

j How much interest would I earn if I invested $800 at 25% for one year?

PART 6

Complete the factor trees.

a

36

3

b

56

7
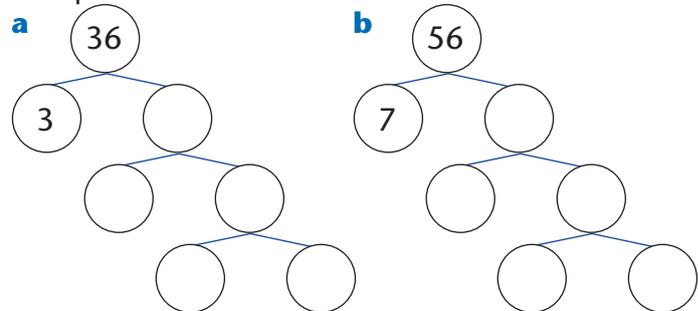
PART 7

Solve these equations.
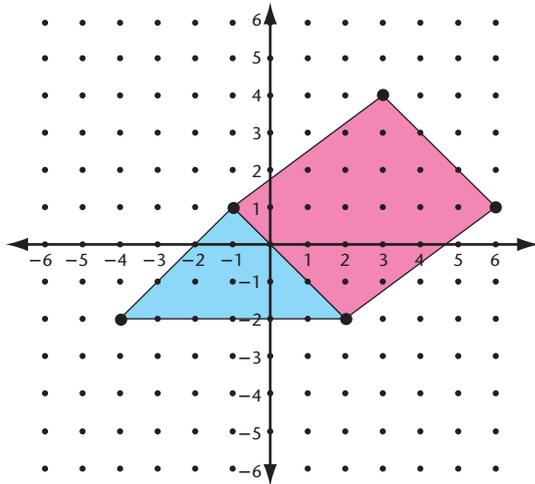
a $15 \times 3 + 5 =$

b $42 + 42 \div 6 =$

c $5 \times (19 - 4) + 3 =$

d $99 - 7 \times 4 =$

e $(20 + 8) \times 2 =$

f $5 \times 8 \div 4 \times 6 =$

g $80 - 25 \times 3 + 10 =$

h $4 \times 88 \div 4 + 10 =$

PART 8
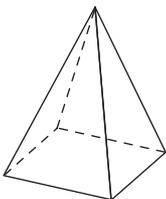
Record the 5 ordered pairs which locate the triangular prism's vertices.

a (   )   b (   )   c (   )   d (   )   e (   )

PART 9
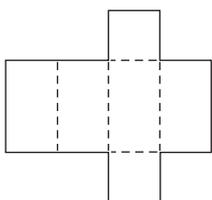
a   Beside the shape draw its net.
Below the shape record the number of faces, vertices and edges it has.
Name the shape.

☐ faces

☐ vertices

☐ edges

Name _____

b   Draw and name the shape being represented by this net.

Name _____
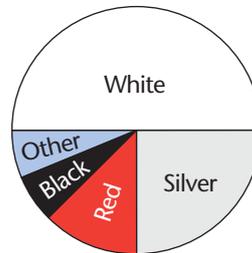
PART 10

Convert these measurements into other units.

a   7000 mL = _____ L   d   75 400 mL = _____ L

b   40 000 L = _____ kL   e   3 000 000 L = _____ ML

c   3500 mL = _____ L   f   50 000 kL = _____ ML

PART 11

Most popular colours for cars

White
Other
Black
Red
Silver
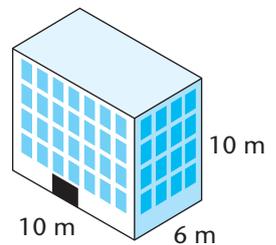
If 1600 cars were sold estimate how many were:

a   White _____

b   Silver _____

c   Red _____

d   Black _____

PART 12

What is the volume of the building?

_____ m³

10 m
10 m
6 m

PART 13

A dice was rolled 20 times to give these scores:

3 4 4 5 1 2 4 5 2 4 6 3 2 5 2 2 1 1 1 4

a   Create a frequency table to display this data.

Score	Tally	Frequency
1		
2		
3		
4		
5		
6		

b   Because 6 only came up once do you think it has more chance than any other number of being the next number thrown?

c   Explain your reason. _____

Who saved the most?

Kim conducted a survey to compare how much money some people earn each week and how much money they save each week.

Task 1:

Use the data provided in the chart below to complete the missing information.

Name	Weekly wage	Fraction/ percentage saved	Amount
Lachlan	$150	$\frac{1}{5}$	
Sophie		25%	$50
Blake	$240		$80
Max	$320	$\frac{1}{8}$	
Hayden		$\frac{1}{6}$	$70
Lucy	$450	20%	
Amy	$600		$60

Task 2:

Decide whether these statements are true or false.

	Statement	T or F	Give your reason
a	Blake saves the largest fraction of his wage.		
b	The person who earns the most saves the most.		
c	As a group, they save more than 20% of what they earn.		
d	If the best saver earned the best wage, that person would save $220 per week.		
e	If Lachlan increases his savings by an extra 5%, he will save an extra $7.50.		
f	If Sophie received a 25% pay rise and maintained her savings rate, her total savings would increase by $12.		

Task 3:

Amy's savings goal is $360. Show how she could increase her weekly savings so that she takes less than 5 weeks to reach her goal.

2-week plan = $_____ per week which is _____% of her weekly wage.

3-week plan = $_____ per week which is _____% of her weekly wage.

4-week plan = $_____ per week which is _____% of her weekly wage.

Oz-tag draw

In the Rocky Oz-tag footy competition, each team has to play every other team once. Mitchell was given the job of printing the draw but he lost the original copy.

Help Mitchell complete the draw.

Task 1:

Complete the draw for Rounds 6 and 7 in the table below.

Rocky Oz-tag			
1. Joeys	4. Sharks	7. Crocs	
2. Sparks	5. Kings	8. Snakes	
3. Lizards	6. BJs		

Round 1	Round 2	Round 3	Round 4
1 v 5	3 v 8	5 v 7	4 v 5
2 v 6	1 v 4	2 v 1	6 v 3
3 v 7	7 v 6	6 v 8	7 v 2
4 v 8	2 v 5	3 v 4	1 v 8

Round 5	Round 6	Round 7
1 v 3		
2 v 4		
5 v 6		
7 v 8		
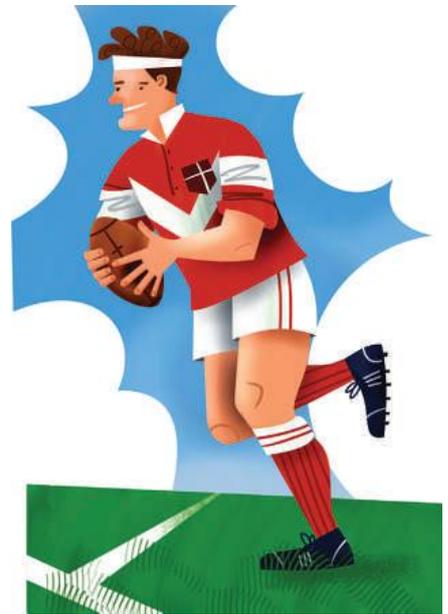
Task 2:

Fill in the progressive points table below by choosing a winning team for each game. Arrange the points so that the Sharks finish third and the Crocs finish fifth.

Win = 3 points   Draw = 2 points   Loss = 1 point

Results	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Round 7	Total
Joeys								
Sparks								
Lizards								
Sharks								
Kings								
BJs								
Crocs								
Snakes								

Planning a house

Blake and Madison are planning a new house.
The table below shows the total area of each room.

Task 1:

Use the data in the table to create a plan view of their house. Consider placing the bathroom near the bedrooms. (You may like to try some plans on another sheet of paper before drawing your final plan here.)

Room	Bed 1	Bed 2	Bed 3	Lounge	Kitchen	Dining	Family	Bath	Study	Laundry	Deck
Area	$16m^2$	$12m^2$	$12m^2$	$30m^2$	$16m^2$	$9m^2$	$16m^2$	$16m^2$	$12m^2$	$6m^2$	$36m^2$

Scale 10 mm = 1 metre

Task 2:

Explain briefly how you have planned the house.

_____

_____

Average speed

Three cars each travelled a distance of 300 kilometres over a 5-hour period.

Task 1:

Create a line graph to match the data below.

Car 1:

- drove at 45 km/h for the first hour
- drove at 105 km/h for the second hour
- took a 30-minute break
- drove at 60 km/h for the next hour
- took a 30-minute break
- drove at 90 km/h for the last hour.

Car 1
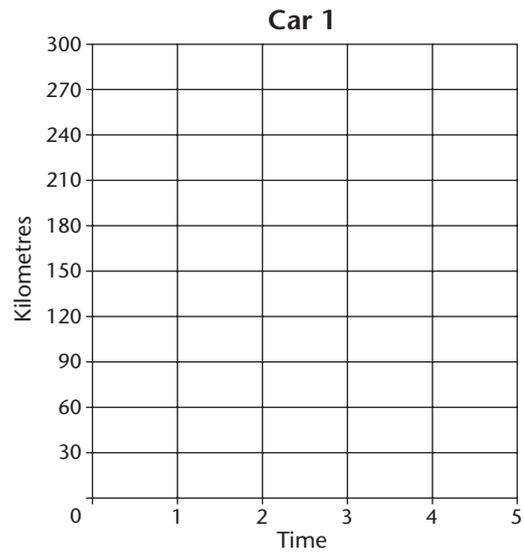
Task 2:

Write a description of the journey shown on each of the graphs below.

Car 2

Car 3
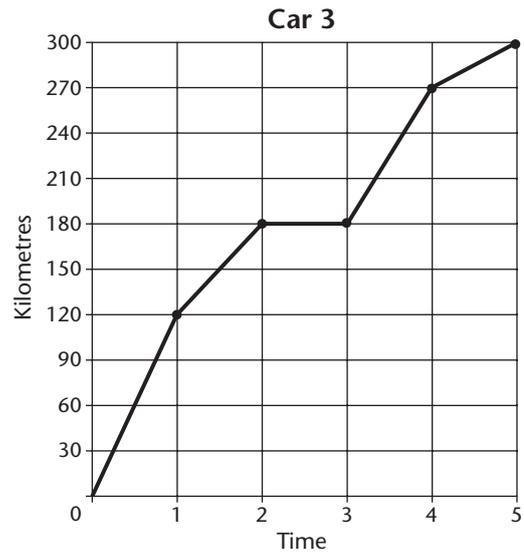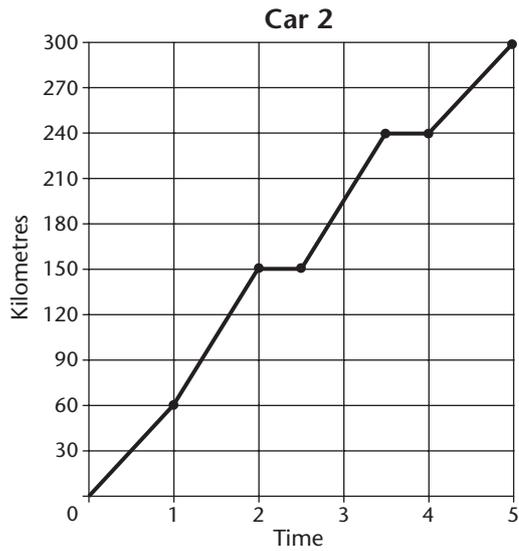
Tennis tournament

Ava   Ben   Cooper   Dylan   Ella

Five players have entered a tennis tournament. Con has to organise the games so that everyone plays each other once.

Help Con organise the draw.

Task 1:

On the tennis courts below, write the names of the players to show all the matches that have to be played. The first one has been done for you. (Note: there are more courts than you need.)

Ava : Ben		

Task 2:

Explain your strategy for solving this problem.

_____

_____

_____

Boxes of toys

Toy cars and trucks come in different sizes. Toy cars are four times more popular than toy trucks.

CAR
20 cm
15 cm
25 cm

TRUCK
20 cm
30 cm
50 cm
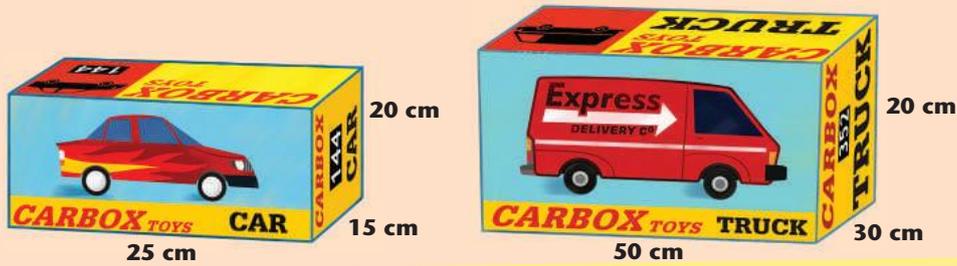
This box is the standard delivery box used by the toy company.

CONTENTS
☐ TRUCK
☐ CARS

DELIVER TO:
Plus Toys
7 Minus Road
Timestown 9654

CARBOX TOYS

0.8 m
1.2 m
2 m

Task:

Explain how you would pack the cars and trucks into the delivery box. You could include a sketch to show your solution.
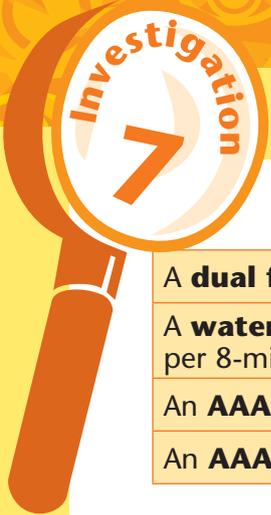
Every drop counts

A **dual flush** toilet uses 3 litres per flush.	A **standard flush** toilet uses 12 litres per flush.
A **water-efficient** showerhead uses 72 litres per 8-minute shower.	A **standard** showerhead uses 120 litres per 8-minute shower.
An **AAA** washing machine uses 72 litres per wash.	An **AA** washing machine uses 156 litres per wash.
An **AAA** dishwasher uses 18 litres per wash.	An **AA** dishwasher uses 40 litres per wash.

Task 1:

The Brown family has a standard flush toilet. The Green family has a dual flush toilet. Both families flush the toilet 25 times each day. Calculate how much more water the Brown family uses:

each day	
each week	
each year	

Task 2:

The Black family has a standard showerhead. The Green family has a water-efficient showerhead. Both families use the shower twice a day. Calculate how much water each family uses each day, and suggest two more ways the Black family could cut its water usage by 50% or more.

Task 3:

The Grey family wash the dishes by hand up to three times a day using 20 litres per wash. The Green family use an AAA dishwasher once a day. Calculate how much more water the Grey family uses:

each day	
each week	
each year	

Task 4:

Suggest ways that your family could reduce water usage in your home.

Did you mean it?

During the semi-finals, the Blue Marlins played three basketball games. Below are some statistics from these games, with some missing data.

Task 1:

Investigate the tables, then calculate and record the missing data.

Players	Round 1	Round 2	Round 3
Jasmine	11		
Lucy	1	2	4
Holly	11	13	8
Eva		12	3
Sienna	17	20	
TOTAL	45	60	55

	Round 1	Round 2	Round 3
MODE	11	13	20
MEDIAN		13	
MEAN	9		11

Task 2:

Analyse the data:

Round 1

* Name the players whose scores were greater than the mean.

  _____

* Name the players whose scores were less than the mean.

  _____

Round 2

* Name the player who scored $\frac{1}{3}$ of the team total.

  _____

* Name the player whose score matched the mean.

  _____
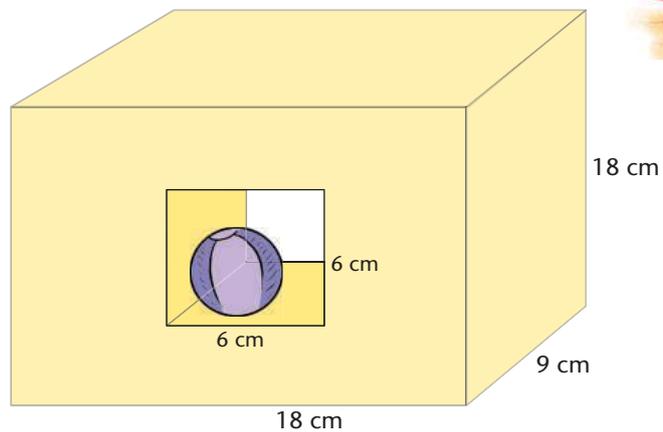
Round 3

* What was Sienna's mean score for the three games?

  _____

* In which round was the median less than the mode?

  _____

Model volume

Jade has made a model using blocks. As she built her model, she created a cavity through the centre.

Task 1:

Explain the strategy you would use to calculate the volume of Jade's model.

_____

_____

_____

_____
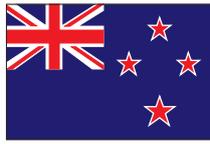
Task 2:

Use your strategy to calculate the volume of Jade's model.

Hamburger exchange

Exchange rates

$1.12
New Zealand
Dollars
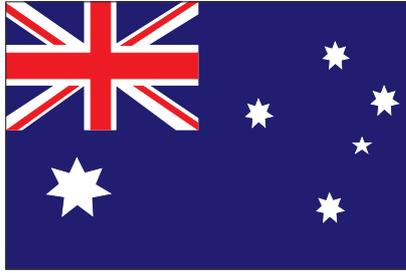
$0.87
Canadian
Dollars

$0.87
American
Dollars

$1 Australian
buys …

€0.52
Euros
(France)

€0.52
Euros
(Germany)
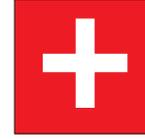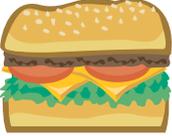
SFr.0.78
Swiss
Francs

Task 1:
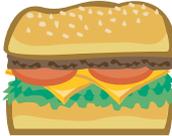
Convert the prices of hamburgers around the world into Australian dollars.

New Zealand NZ$2.24	France €4.68	USA US$4.69
A$ _____	A$ _____	A$ _____
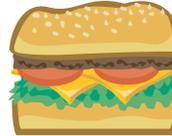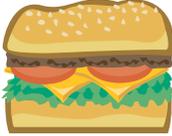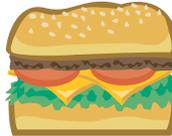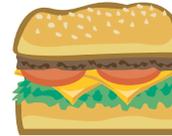
Canada C$4.15	Germany €2.60	Switzerland SFr.6.24
A$ _____	A$ _____	A$ _____

Task 2:

Use the chart below to order the hamburgers from cheapest to dearest.

Country						
Cost						

Task 3:

How much are hamburgers where you live? _____

Gone Fishin'

The *Daily Fish* newspaper publishes a 'fishing guide graph' every day. The graph shows what the experts predict to be the best fishing times during the week.

Logan and Oscar both love fishing. They go fishing at every opportunity they can get.

Logan is a firefighter. He starts work at 7 am and finishes at 3 pm. This week, he is working from Monday to Thursday.

Oscar is a nightshift worker. He works Sunday to Thursday starting at 11 pm and finishing at 7 am the next day.
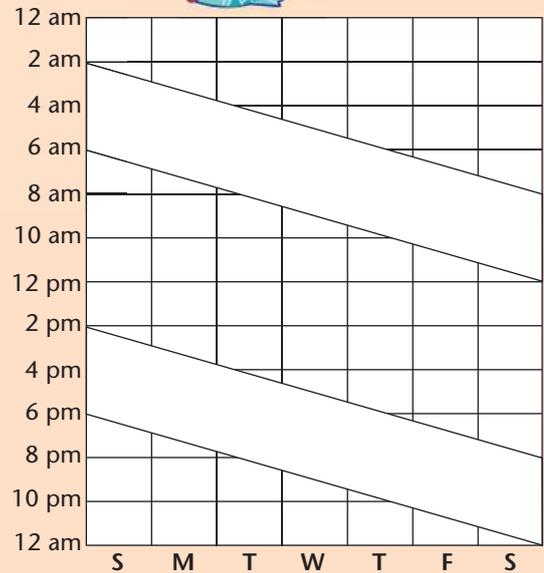
Task:

List which times Logan and Oscar could go fishing this week, and which times they should mark as 'priority' times. Highlight any times they could go fishing together.

Australia's population

The chart below shows how Australia's population has increased in the 21st century.

Interesting facts

• About 20% of Australians are in the 0–14 years age group.

• About 70% of Australians are in the 15–64 years age group.

• Life expectancy for males is 82 years.

• Life expectancy for females is 84 years.

State	2001	2006	2007	2008	2010
New South Wales	6 372 000	6 818 100	6 890 000	6 947 000	
Victoria	4 645 000	5 133 000	5 210 000	5 274 400	
Queensland	3 655 000	4 089 500	4 180 000	4 253 200	
South Australia	1 467 000	1 563 700	1 580 000	1 598 000	
Western Australia	1 851 000	2 053 300	2 100 000	2 149 100	
Tasmania	457 00	489 900	493 000	497 300	
Northern Territory	211 000	210 700	215 000	218 400	
ACT	312 000	333 400	339 000	342 700	
Total	18 979 000	20 691 600	20 945 800	21 282 600	

Task 1:

Examine the population trends in order to estimate the population of each state and territory and Australia's total population for the year 2010.

Task 2:

Refer to the 'interesting facts' in order to calculate the following. (Australia's population can be rounded to 22 000 000.)

There are about _____ Australians aged from 0 to 14 years.

There are about _____ Australians aged from 15 to 64 years.

There are about _____ Australians aged 65 and over.

My new car

Price Schedule: Toyundi Chariot		Luxury	Deluxe	Standard
Start Price		$20 799	$17 499	$16 449
Blue Tooth	$450			
Metallic Paint	$600			
Automatic	$1500			
Sun Roof	$1050			
Air-Conditioning	$2400			
Total		$21 849	$21 849	$21 849

Task 1:

Use the chart above to show three different ways of spending exactly $21 849 on a new car.

Task 2:

Investigate these options to find out which one represents the best value:

• The Standard Toyundi Chariot or the Deluxe with a 10% discount?

• The Deluxe Toyundi Chariot or the Luxury with a 10% discount?

• The Standard Toyundi Chariot or the Luxury with a 20% discount?

Aussie rules

In the grand final between the Dolphins and the Stingrays, each team had 30 scoring shots.

Task 1:

Investigate all possible game scores using the scoring system below. Record some of your game scores on the scoreboards below.

Scoring system
Goal = 6 points Behind = 1 point

One possible score:

	Goals	Behinds	Total
Dolphins	15	15	105
Stingrays	12	18	90

	Goals	Behinds	Total
Dolphins			
Stingrays			

	Goals	Behinds	Total
Dolphins			
Stingrays			

	Goals	Behinds	Total
Dolphins			
Stingrays			

Task 2:

What is the smallest difference in the scores you created?

What is the largest difference in the scores you created?

What pattern did you notice in the sets of scores you created?

Coolangatta to Townsville

Your family is planning a trip from Coolangatta to Townsville. Your investigations on the Internet show that the total distance is about 1475 km. The grid below shows locations you will visit along the way. It also has the average speed at which you will travel.

Task 1:

Research the distance between the towns and add them to the grid.

Task 2:

Calculate the time it will take to complete each section, travelling at the suggested speed.

Start	Finish	Kilometres	Speed (km/h)	Hr:min
Coolangatta	Brisbane		50 km/h	1:00
Brisbane	Noosa		60 km/h	
Noosa	Bundaberg		65 km/h	
Bundaberg	Rockhampton		70 km/h	
Rockhampton	Mackay		80 km/h	
Mackay	Townsville		80 km/h	
Total		1475		

Task 3:

Research the cost of petrol and estimate how much money you will spend on petrol if you use between 140 and 160 litres.

_____

_____

_____

Task 4:

Research the costs of motels or campsites at a place where you might have an overnight stay.

_____

_____

_____

Where in the world?
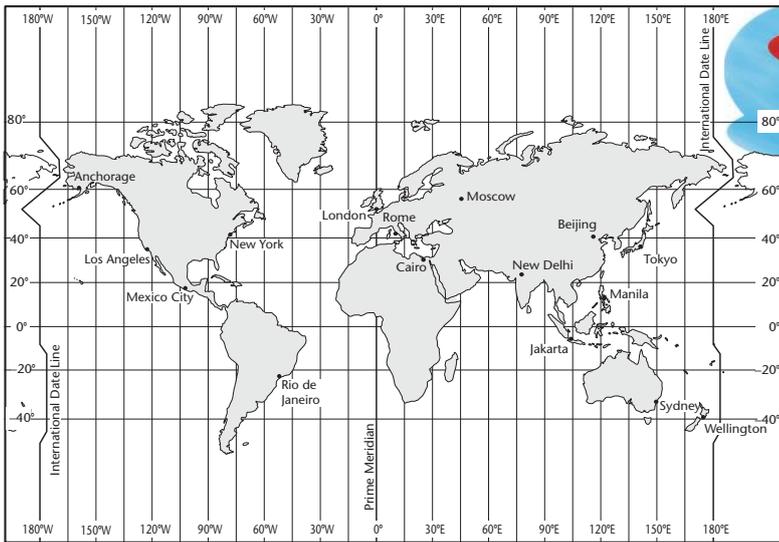
Task 1:

Follow the clues to find Isabella.

Clue	City
Isabella started in the Northern Hemisphere in a city with a latitude of 43°N and a longitude of 76°W.	
The second city she visited meant she flew 9° towards the south and 42° towards the west.	
The third city she visited was in the Southern Hemisphere. It is 23° south of the Equator and its longitude 43°W.	
The fourth city she visited meant she flew 11° towards the south and 194° towards the east.	
The last city she visited is back in the Northern Hemisphere. It meant she flew 70° towards the north and 11° towards the west.	

Task 2:

Write some clues for a friend to follow to take them to some of the other cities shown on the world map.

_____

_____

_____

_____

_____

My investigation review

Name: _____ **Date:** _____

Investigation: _____

Before

1 What do I have to do? _____
_____
_____

2 Do I have a strategy? _____
_____
_____

3 Do I need materials? _____
_____
_____

4 How am I going to do it? _____
_____
_____

After

1 What did I find out? _____
_____
_____
_____
_____
_____

2 Did my strategy work? _____
_____
_____
_____
_____
_____

Dictionary

acute angle
An angle less than 90°.

acute angle

addend
Any number which is added to obtain the sum or total.

$$3 + 7 + 8 = 18$$
(addends)   (sum)

adjacent
Next to; adjacent sides of a triangle have a common vertex.

X

Y   Z
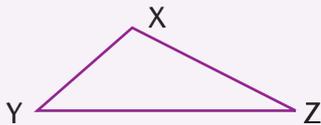
XY and YZ are adjacent because they have a common vertex, Y.

algebra
Where letters or symbols are substituted for numbers in a number sentence.
$$3 \times b = 15 \quad (b = 5)$$

algorithm
The calculation procedure for setting out a mathematical problem in a certain way.
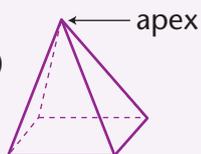
$$\begin{array}{r} 324 \\ + 207 \\ \hline \end{array} \qquad \begin{array}{r} 874 \\ - 23 \\ \hline \end{array} \qquad \begin{array}{r} 364 \\ \times 30 \\ \hline \end{array}$$

am
Abbreviation from the Latin words *ante meridiem* (before noon). Any time from midnight to noon.

apex
The highest point of a solid (3D) object from its base.

apex

associative property
When using addition and multiplication, it doesn't matter how the numbers are grouped. The answers will always remain the same.

$$5 \times 4 \times 2 = 40 \qquad 3 + 6 + 7 = 16$$
and   and
$$5 \times 2 \times 4 = 40 \qquad 7 + 3 + 6 = 16$$

average
The total of a series of numbers divided by the amount of numbers in the group.

Average of 3, 5, 7, 9:
- add $3 + 5 + 7 + 9 = 24$
- divide 24 by the number of scores
$$24 \div 4 = 6$$
The average is 6.

axis
A line which divides a shape symmetrically in half.

axis of symmetry
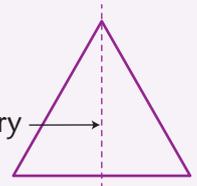
Lines of reference for a graph.

vertical axis
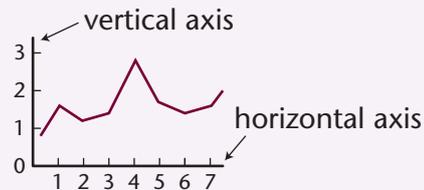
horizontal axis

Celsius
A scale for measuring temperature.

0°C	➔	ice begins to melt
100°C	➔	boiling point of water
36.9°C	➔	human body temperature

circumference
The distance around a circle.

CIRCUMFERENCE
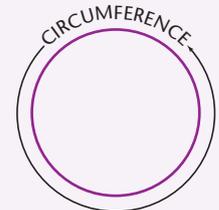
column graph
A graph where vertical columns or horizontal bars are used to represent data.

Soccer Club Members

Boys Girls Men Women
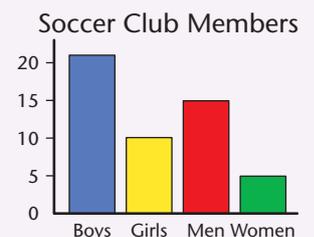
commutative law
Numbers can be added or multiplied in any order.

$$5 + 6 \text{ is equal to } 6 + 5$$
$$5 \times 7 \text{ is equal to } 7 \times 5$$

complementary angles
Two angles whose sum is 90°.

a
b
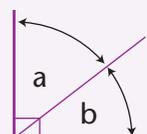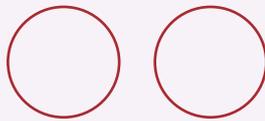
Dictionary

composite number
A number that has more than two factors.
Example: 10 has four factors – 1, 2, 5 and 10.

congruent
Two shapes or objects that are identical in all ways.

congruent circles

coordinate points (grid references)
Coordinates or grid references locate points or positions on a grid. The horizontal position is given before the vertical position. E.g. The circle is located at C3.
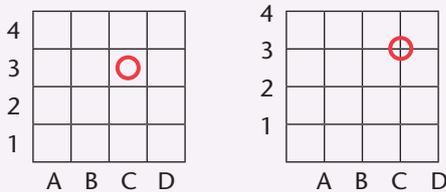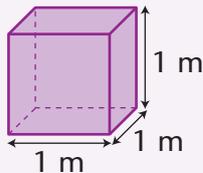
cross-section
The shape of the face made by slicing through a solid. Example:

cross-section
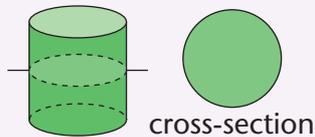
cubic metre (m³)
A metre cube has a volume equal to one cubic metre.

1 m
1 m
1 m

denominator
The bottom number of a fraction that tells how many equal parts in the whole.

$\frac{1}{4}$ ➔ numerator
➔ denominator

diameter
A straight line touching both sides of a circle which passes through the centre point.

diameter
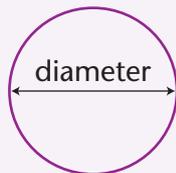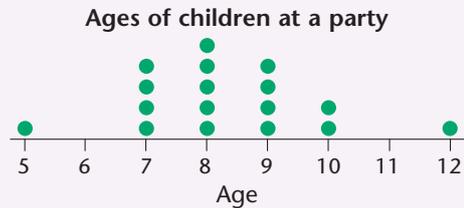
divided bar graph
A graph that shows how a total is divided into parts.

Science	Art	Maths
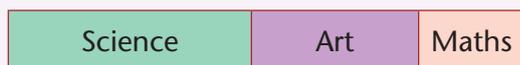
dot plot
A graph that uses scale to represent data. Each value is recorded as a dot.

Ages of children at a party

5 6 7 8 9 10 11 12
Age

edge
The intersection of two faces.

edge
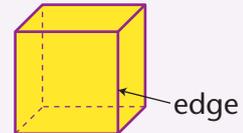
elapsed time (duration)
The time taken to do something. For example, the time it takes to prepare a meal is elapsed time.

equilateral triangle
A triangle that has three equal sides and three equal angles.
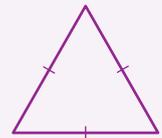
equivalent fractions
Fractions that have the same value.

$$\frac{70}{100} = \frac{7}{10}$$

faces
The surfaces of a three-dimensional (solid) object.

face
face
face
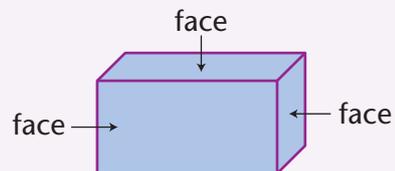
factor
Any whole number that can be multiplied with another to make a given number.

Factors of 12: 12, 6, 4, 3, 2, and 1

factor tree
A diagram that displays factors of a number.

36
6 × 6
3 × 2 × 3 × 2
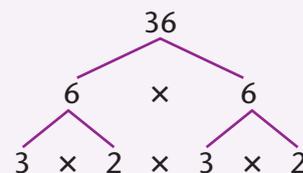
frequency
In a collection of data, the frequency of a category is the number of occurrences for that category.

Animal	Frequency
Sheep	𝍷𝍷𝍷 𝍷𝍷𝍷 |||
Horses	𝍷𝍷𝍷 ||
Cows	𝍷𝍷𝍷 𝍷𝍷𝍷 𝍷𝍷𝍷
Dogs	||

The frequency of the horses in the table is 7.

greater than ($>$)
Symbol used to show that one number has a value greater than the other number.

$$27 > 15$$

gross mass
The total mass of any item, including its packaging.
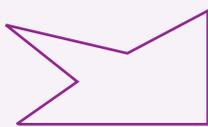
hectare (ha)
A unit of area.
1 ha = 10 000 m^2

hexagon
A 2D shape with six straight sides.

regular   irregular
hexagon   hexagon

horizontal
A straight line at right angles to the vertical and parallel to the horizon.

← vertical line

horizontal line
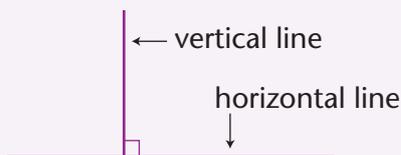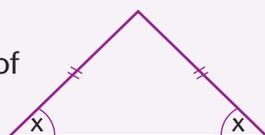
improper fraction
A fraction where the numerator is greater than the denominator. Improper fractions have a value greater than one whole.

$\dfrac{5}{3}$ ➔ numerator
   ➔ denominator

isosceles triangle
A triangle that has two sides of equal length and two angles the same size.

kilogram (kg)
A mass unit.
1 kg = 1000 grams

FLOUR
1 kg

kilolitre (kL)
A capacity unit.
1 kL = 1000 litres

kilometre (km)
A length unit.
1 km = 1000 metres
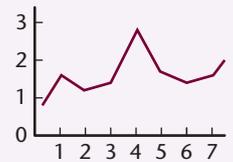
less than ($<$)
Symbol used to show that one number has a value less than the other number.

$$240 < 420$$

line graph
Information represented on a graph by joining plotted points with a line.

mean
The centre of a set. It is found by adding all the values in the data sample, then dividing the total by the number of values in the set. It is often called 'the average'.

8 is the mean for the scores:
6, 8, 6, 9, 10 and 9

$$\frac{6 + 8 + 6 + 9 + 10 + 9}{6} = 8$$
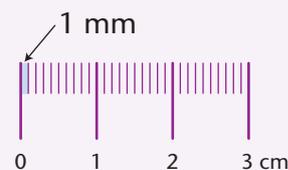
metre (m)
The basic SI unit of length.

1 metre = 1000 mm
1 metre = 100 cm

millilitre (mL)
A measurement of capacity.
1000 mL = 1 litre

millimetre (mm)
A measurement of length.
1 mm = 1 thousandth of a metre
10 mm = 1 centimetre

1 mm

0   1   2   3 cm

Dictionary

million
1 000 000

$$1000 \times 1000 = 1\,000\,000$$
$$\text{or}$$
$$10 \times 100\,000 = 1\,000\,000$$

mixed numerals
A number that consists of a whole number and a fractional part.

For example: $4\frac{1}{2}$

multiple
The result of multiplying a given number by any other number is a multiple of that given number. Multiples of 3 are: 3, 6, 9, 12, 15, 18, etc.

negative numbers
Numbers that have a value less than zero.
A minus sign is placed in front of a number to identify it as negative.

For example: The temperature was $-5°C$

net
A flat shape which can be folded to make a 3D object.
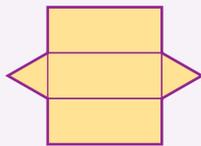
Net of a triangular prism

net mass
The mass of any item without its packaging.

numerator
The top number of a fraction, telling us how many parts there are out of the whole.

$\dfrac{3}{4}$ ➔ numerator
➔ denominator

obtuse angle
An angle larger than 90° but less than 180°.

130°
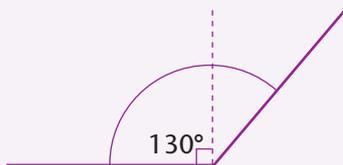
order of rotational symmetry
The number of times a shape matches the original as it completes one full rotation.
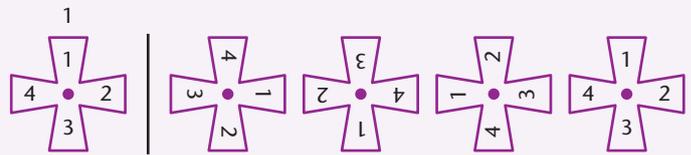
Order of rotation of 4

Any shape that still looks the same when it is turned around a fixed point has rotational symmetry.

outcome
The result of a mathematical investigation. For example, when three coins are tossed there are 8 possible outcomes.

H T T   H T H
T H H   T H T
H H H   H H T
T T T   T T H
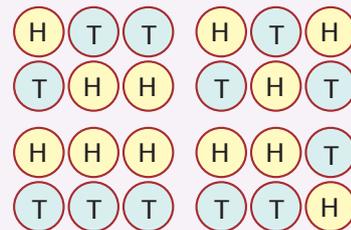
per cent (%)
A fraction of 100.

87% means 87 out of 100
i.e. $\frac{87}{100} = 87\% = 0.87$

perimeter
The distance around the outside of a shape.

3 m   5 m
4 m
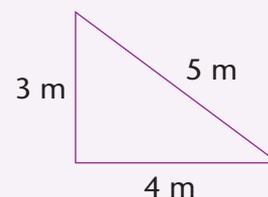
Perimeter = 3 m + 4 m + 5 m
Perimeter = 12 m

perpendicular lines
Lines which meet at right angles.
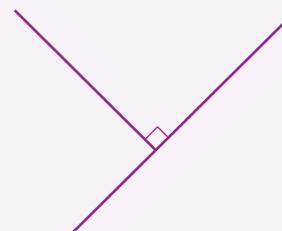
pie sector graph
A circular graph whose parts look like portions of a pie.

plan
A diagram from above, showing the position of objects. Also known as the top view of a 3D object.
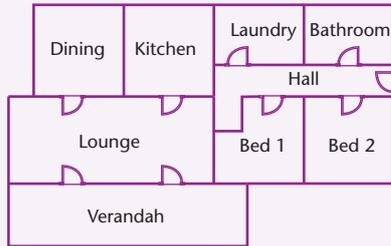
pm
Abbreviation for the Latin words *post meridiem* which means after midday.

polygon
A 2D shape with three or more angles and straight sides.

hexagon   pentagon
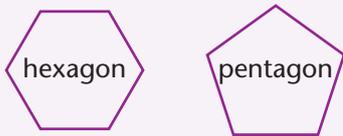
prime number
A number that is divisible only by itself and 1.
Examples:
2, 3, 5, 7, 11, 13, 17, 19, 23, 29

probability
The likelihood or chance of an event happening. The range of probability is from zero to one.

0   1

unlikely   likely
to happen   to happen

Probability of zero   Probability of 1
Impossible   *Certain*
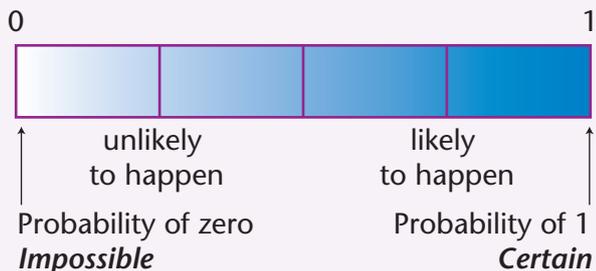
quadrilateral
A 2D shape with four straight sides.
Examples:

square   oblong
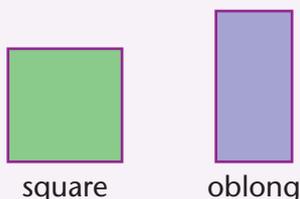
radius
A straight line extending from the centre of a circle to the circumference.

radius
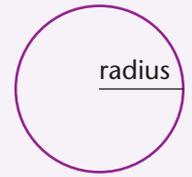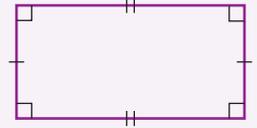
ray
A line that has a starting point but does not end.
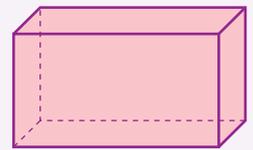
rectangle
A four-sided figure with four right angles and two pairs of parallel sides.
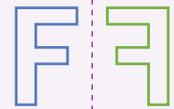
rectangular prism
A 3D object which consists of six rectangular faces.

reflective symmetry
A mirror image of a shape.
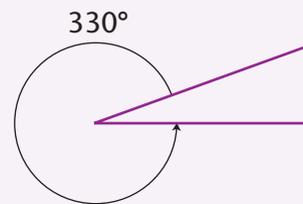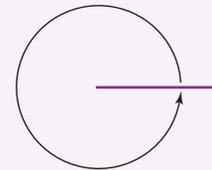
reflex angle
An angle between 180° and 360°.
Example: 330°
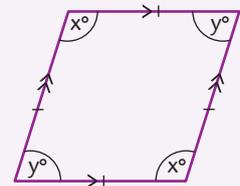
revolution
A full turn of 360°.

rhombus
A four-sided shape with four equal sides. Opposite angles are equal and it has two sets of parallel lines.

x°   y°

y°   x°

Roman numerals
Number system devised by the ancient Romans.

Examples:
I = 1   D = 500
V = 5   M = 1000
X = 10
L = 50   XCV = 95
C = 100   MMX = 2010
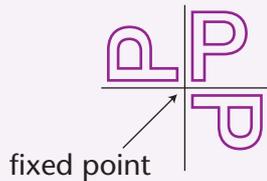
Dictionary
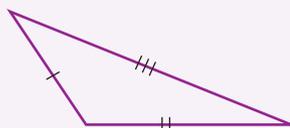
rotation
The turning of an object through a fixed point.

fixed point

scalene triangle
A triangle with sides of different lengths and angles of different sizes.
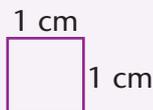
sequence
An order of numbers or objects arranged according to a rule or pattern:

Example:

Number	1	2	3	4
$	$5	$10	$15	$20

square centimetre (cm²)
A unit for measuring area.
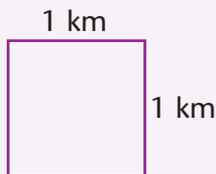
1 cm

1 cm

$1 \text{ cm} \times 1 \text{ cm} = 1 \text{ cm}^2$

square kilometre (km²)
A unit for measuring area.
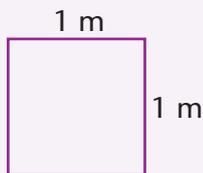
1 km

1 km

$1 \text{ km} \times 1 \text{ km} = 1 \text{ km}^2$

square metre (m²)
A unit for measuring area.

1 m

1 m

$1 \text{ m} \times 1 \text{ m} = 1 \text{ m}^2$

square number
The product of a number multiplied by itself.
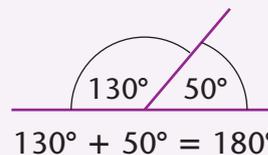
Examples:
$2^2 = 2 \times 2 = 4$
$3^2 = 3 \times 3 = 9$
$4^2 = 4 \times 4 = 16$
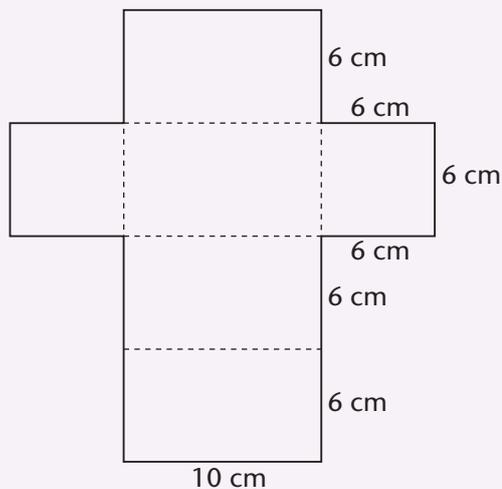
supplementary angles
Two angles that have a total of 180°.

130° 50°

$130° + 50° = 180°$

surface area
The total area of all faces of a 3D object.

6 cm
6 cm
6 cm
6 cm
6 cm
6 cm
10 cm

A rectangular prism has six faces.
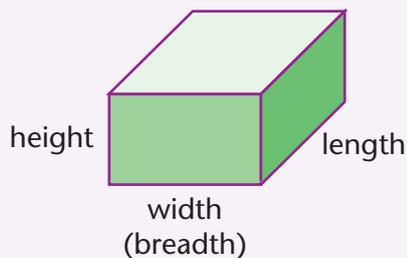
tally marks
Groups of marks used to keep count. Every fifth mark usually crosses the four before it.

|||| |||| |||| || = 17

three-dimensional (3D)
Solid objects have three dimensions: height, length, width (breadth).

height   length
width
(breadth)

timeline
A line which represents a span of time.

1985	1990	1995	2000	2005
Born	School	High school		Work

tonne
1000 kilograms.

Dictionary

translate (slide)
The sliding of a shape into a new position.

slide →
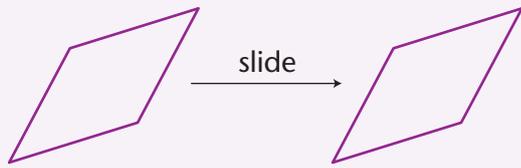
trapezium
A four-sided figure that has two parallel sides and two that are not parallel.
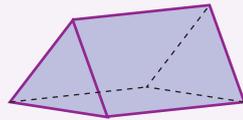
triangular numbers
Numbers that can be arranged as a triangular pattern.

3   6
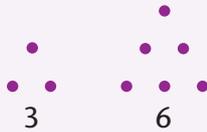
triangular prism
A prism with two congruent triangles as bases,
3 rectangular faces,
9 edges and 6 vertices.

triangular pyramid (tetrahedron)
3D object with 4 triangular faces, 6 edges and 4 vertices.
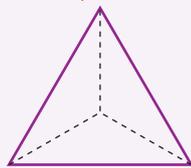
turn
To rotate a shape around a point.
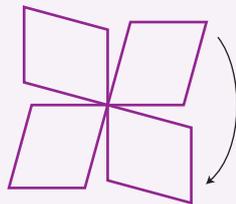
twelve-hour time
Analogue clocks break the day into two lots of 12 hours:
am (midnight–midday)
pm (midday–midnight)

twenty-four hour time
Time divided into 24-hour intervals, so as to distinguish between am and pm.

18:00

two-dimensional (2D)
Plane shapes have only two dimensions: length and width (breadth).

width (breadth)

length
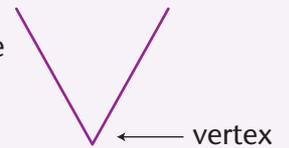
unit fraction
Fractions with a numerator of 1.

Examples:
$$\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}, \frac{1}{10}$$
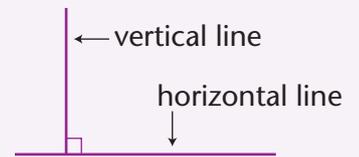
vertex
The point where two or more lines meet to form an angle.

← vertex

vertical
Vertical lines are at right angles to the horizontal.

← vertical line

horizontal line

vertices
Plural of vertex.
A triangle has 3 vertices.
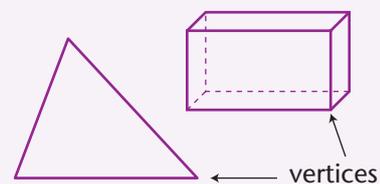
← vertices

A rectangular prism has 8 vertices.

volume
The amount of space an object occupies.
Formula:
Volume = length × width × height

2 m

2 m

3 m
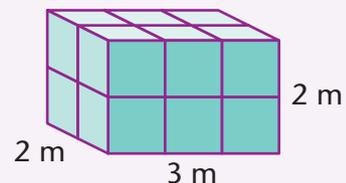
Volume = 3 m × 2 m × 2 m = 12 m^3

whole numbers
The counting numbers from one to infinity.

1, 2, 3, 4, ➔ infinity

Answers

Unit 1

1 **a** 281 733   **c** 343 304
b 435 714   **d** 320 400

2 **a** 727 256   **b** 357 492   **c** 806 207   **d** 810 027

3

Jumbled	Millions			Thousands			Ones			Spaced numbers
	Hund	Tens	Ones	Hund	Tens	Ones	Hund	Tens	Ones	
a	11234						1	1	2	3	4	11 234
b	32451						3	2	4	5	1	32 451
c	736041				7	3	6	0	4	1	736 041
d	5425006		5	4	2	5	0	0	6	5 425 006
e	7325400		7	3	2	5	4	0	0	7 325 400
f	76245236	7	6	2	4	5	2	3	6	76 245 236

4 **a** 93   **d** 163   **g** 164   **j** 285   **m** 704
b 173   **e** 286   **h** 277   **k** 195   **n** 913
c 192   **f** 175   **i** 362   **l** 394   **o** 351

5 **a** 600   **f** 1200   **k** 1500   **p** 2800
b 800   **g** 500   **l** 800   **q** 5900
c 500   **h** 600   **m** 1600   **r** 2700
d 1000   **i** 1300   **n** 1800
e 800   **j** 900   **o** 1900

6 **a** 36   **d** 29   **g** 254   **j** 137   **m** 307
b 39   **e** 49   **h** 129   **k** 149   **n** 238
c 44   **f** 144   **i** 165   **l** 270   **o** 167

7 **a** 193 sheep   **d** 1594 km
b 501 g   **e** 115 vehicles
c 117 clips

8 **a** obtuse   **f** right angle
b acute   **g** obtuse
c right angle   **h** reflex
d acute   **i** acute
e straight

9 Hands on (possible answers below).

An acute angle   An obtuse angle   A right angle
of 40°   of 110°   of 90°

10 **a** 30 **b** 50 **c** 35 **d** 20 **e** Games

11

Blue	Green	Brown	Hazel

12 **a** Blue   **b** Green   **c** 4

---

13 Hands on. Some results. Students would need to include children from other schools. Also survey different areas across the state.

Unit 2

1

×	4	6	5	0	7	10	9	3	8	1
3	12	18	15	0	21	30	27	9	24	3
4	16	24	20	0	28	40	36	12	32	4
5	20	30	25	0	35	50	45	15	40	5
6	24	36	30	0	42	60	54	18	48	6
7	28	42	35	0	49	70	63	21	56	7
8	32	48	40	0	56	80	72	24	64	8
9	36	54	45	0	63	90	81	27	72	9

2 **a** 20   **f** 120   **k** 180   **p** 1200
b 200   **g** 350   **l** 270   **q** 2000
c 42   **h** 350   **m** 280   **r** 3600
d 420   **i** 180   **n** 400   **s** 6400
e 240   **j** 180   **o** 360   **t** 6300

3 **a** 60   **d** 90   **g** 180   **j** 210
b 70   **e** 100   **h** 240   **k** 220
c 80   **f** 120   **i** 190   **l** 250

4 **a** 48   **d** 88   **g** 180   **j** 128   **m** 184
b 60   **e** 72   **h** 64   **k** 104   **n** 256
c 64   **f** 132   **i** 96   **l** 112   **o** 136

5 **a** 60   **d** 180   **g** 300   **j** 1000
b 80   **e** 140   **h** 240   **k** 1800
c 150   **f** 160   **i** 160   **l** 1400

6 **a** 11.266 m   **c** 17.007 m   **e** 12.042 m
b 10.429 m   **d** 12.004 m   **f** 10.707 m

7 **a** 61.883   **d** 46.619   **g** 49.009
b 37.944   **e** 61.066   **h** 63.981
c 52.916   **f** 56.542

8 **a** equilateral   **c** scalene
b isosceles   **d** right angle

9

10 Record the properties of these regular polygons.

	Name	Number of sides	Number of angles	Number of axes of symmetry
a	pentagon	5	5	5
b	hexagon	6	6	6
c	octagon	8	8	8

11

Shape	L × W	Area
a	4 × 3	12 cm²
b	5 × 3	15 cm²
c	4 × 2	8 cm²
d	7 × 2	14 cm²

12

Shape	L × W	Area
a	9.6 × 3	28.8 cm²
b	6.3 × 2	12.6 cm²
c	7.2 × 2	14.4 cm²

13 **a** = (4 cm × 3 cm) + (3 cm × 2 cm)
= 12 cm² + 6 cm²
= 18 cm²
b = (4 cm × 1 cm) + (2 cm × 2 cm)
= 4 cm² + 4 cm²
= 8 cm²
c = (4 cm × 2 cm) + (3 cm × 2 cm)
= 8 cm² + 6 cm²
= 14 cm²

Unit 3

1 **a** True   **c** True   **e** False
b False   **d** True   **f** True

2 **a** 1, 2, 5, 10
b 1, 2, 3, 4, 6, 12
c 1, 2, 7, 14
d 1, 2, 4, 8, 16
e 1, 2, 3, 6, 9, 18
f 1, 2, 4, 5, 10, 20
g 1, 2, 3, 4, 6, 8, 12, 24
h 1, 2, 3, 5, 6, 10, 15, 30
i 1, 2, 4, 7, 14, 28
j 1, 2, 4, 5, 8, 10, 20, 40
k 1, 2, 4, 6, 8, 12, 24, 48

3 **a** 2   **d** 4   **g** 4
b 3   **e** 9   **h** 5
c 3   **f** 2

4

a 10% **b** 27% **c** 50% **d** 100% **e** 5%

5

	Fraction	Hundredths	Decimal	Percentage
a	$\frac{1}{10}$	$\frac{10}{100}$	0.10	10%
b	$\frac{2}{10}$	$\frac{20}{100}$	0.20	20%
c	$\frac{1}{4}$	$\frac{25}{100}$	0.25	25%
d	$\frac{3}{10}$	$\frac{30}{100}$	0.30	30%
e	$\frac{4}{10}$	$\frac{40}{100}$	0.40	40%
f	$\frac{1}{2}$	$\frac{50}{100}$	0.50	50%
g	$\frac{6}{10}$	$\frac{60}{100}$	0.60	60%
h	$\frac{7}{10}$	$\frac{70}{100}$	0.70	70%
i	$\frac{3}{4}$	$\frac{75}{100}$	0.75	75%
j	$\frac{8}{10}$	$\frac{80}{100}$	0.80	80%
k	$\frac{9}{10}$	$\frac{90}{100}$	0.90	90%
l	1	$\frac{100}{100}$	1.0	100%

6 **a** 36%   **c** 99%   **e** 50%   **g** 70%
b 74%   **d** 67%   **f** 10%   **h** 90%

7 **a** 1   **b** 4   **c** 9   **d** 16

Answers

8 a

$5 \times 5 = 25$

c
$7 \times 7 = 49$

b
$6 \times 6 = 36$

9 a 25
 b 1, 4, 9, 16, 25, 36, 49, 64, 81, 100

10 a 121 **b** 144 **c** 169 **d** 196 **e** 225

11

Triangular pyramid
Hexagonal prism
Triangular prism
Rectangular prism
Square pyramid
Cylinder

12

	Object	Faces	Edges	Vertices
a	Triangular pyramid	4	6	4
b	Hexagonal prism	8	18	12
c	Triangular prism	5	9	6
d	Rectangular prism	6	12	8
e	Square pyramid	5	8	5
f	Cylinder	3	2	0

13 a Square pyramid.
 b Pentagonal prism.

Unit 4

1 Exact answers:
 a 142 **e** 384 **i** 62 **m** 44r5
 b 131 **f** 132r1 **j** 72 **n** 89r2
 c 131 **g** 61r3 **k** 151r2 **o** 65r2
 d 173 **h** 71r1 **l** 219r2

2 a 14**5** **c** 2**5**2 **e** **2**65 **g** **4**5
 b **4** **d** **3** **f** 3**1** **h** 3**8**

3 Hands on.

4 a 9, 10, 11, 12, 13, 14, 15
 b 2nd number is 8 more than the 1st number.
 c 18
 d 3, 6, 9, 12, 15, 18, 21

e 2nd number is 3 times the value of the 1st number.
 f 30
 g 9, 18, 27, 36, 45, 54, 63
 h 2nd number is 9 times the value of the 1st number.
 i 90
 j 18, 19, 20, 21, 22, 23, 24
 k 2nd number is 17 more than the 1st number.
 l 27
 m 99, 90, 81, 72, 63, 54, 45
 n 2nd number is 9 times the value of the 1st number.
 o 18
 p 14, 24, 34, 44, 54, 64, 74
 q 2nd number is 13 less than the 1st number.
 r 104

5 a 50° **b** 210° **c** 120°

6 360°

7

Angle	a	b	c	d	e	f	g	h	i	j	k	l
Degree	140	40	140	40	60	120	60	120	110	70	70	110

8

Shape	Length	Width	Height	Volume
a	6	1	2	12 cm³
b	4	2	2	16 cm³
c	5	4	2	40 cm³
d	4	3	5	60 cm³
e	6	2	5	60 cm³

(Volume column: $12\,cm^3$, $16\,cm^3$, $40\,cm^3$, $60\,cm^3$, $60\,cm^3$)

9 Hands on.
 (Length × Width × Height = Volume)

10 4 cubes high.

Unit 5

1 a 9 **d** 10 **g** 4 **j** 5 **m** 9
 b 5 **e** 7 **h** $2 **k** $7 **n** 6
 c 7 **f** 8 **i** $5 **l** $9

2 a 600 **e** 3000 **i** 4000 **m** 5400
 b 1200 **f** 2100 **j** 8100 **n** 4200
 c 1500 **g** 4500 **k** 6300 **o** 3600
 d 2000 **h** 1800 **l** 7200

3 a 75 **e** 144 **i** 228 **m** 669
 b 108 **f** 217 **j** 370 **n** 1160
 c 168 **g** 225 **k** 378 **o** 2178
 d 189 **h** 162 **l** 536

4 a 9 **c** $3500 **e** 2000 m
 b $175 **d** 8 **f** 456

5 a 53.02 **c** 62.51 **e** 5.401 **g** 4.283
 b 33.11 **d** 15.17 **f** 2.227 **h** 4.484

6 a 2.2 kg **c** 0.215 kg
 b 0.915 kg **d** 0.995 kg

7 a 11.025 kg **c** $108.30 **e** 1.462 m
 b 2.79 m **d** 1.245 m **f** No.

8 a

a	b	c	d	e	f
1	2	4	5	1	1

9 a

 b
 c
 d

10 a

 c **e** **g**
 b **d** **f** **h**

11 a $\frac{2}{34}$ **c** $\frac{6}{34}$ **e** $\frac{11}{34}$ **g** Even
 b $\frac{8}{34}$ **d** $\frac{7}{34}$ **f** Yes **h** No

12 a $\frac{5}{10}$ **b** $\frac{4}{10}$ **c** $\frac{0}{10}$ **d** $\frac{4}{10}$ **e** $\frac{10}{10}$ **f** $\frac{7}{10}$

13 a blue = 6 **d** yellow = 3
 b green = 9 **e** pink = 4
 c red = 2

14 Hands on.

Unit 6

1 a 31 811 **b** 52 202 **c** 21 111
 d 25 080 **e** 16 389 **f** 20 647
 g 26 767 **h** 45 229 **i** 48 921
 j 64 663 **k** 43 886 **l** 67 449
 − 26 405 − 33 821
 17 481 33 628

 m 55 282 **n** 77 812 **o** 89 446
 − 23 728 − 54 014 − 48 091
 31 554 23 798 41 355

2 a 7 418 150 **b** 2 289 310 **c** 1 910 130

3 Hands on.

4 Vietnam (244 820 + 84 740 = 329 560).

5

	Improper fraction	Mixed number
a	$\frac{11}{6}$	$1\frac{5}{6}$
b	$\frac{13}{8}$	$1\frac{5}{8}$
c	$\frac{13}{5}$	$2\frac{3}{5}$
d	$\frac{9}{4}$	$2\frac{1}{4}$

6 a $\frac{5}{4}$ **c** $\frac{11}{4}$ **e** $\frac{13}{4}$ **g** $\frac{9}{4}$
 b $\frac{7}{4}$ **d** $\frac{14}{4}$ **f** $\frac{17}{4}$ **h** $\frac{19}{4}$

175

Answers

7 a $1\frac{1}{4}$ c $2\frac{1}{4}$ e $2\frac{2}{4}$ g $3\frac{1}{4}$
b $1\frac{3}{4}$ d $1\frac{2}{4}$ f $3\frac{3}{4}$ h $4\frac{1}{4}$

8 a $\frac{7}{5} = 1\frac{2}{5}$ e $\frac{5}{4} = 1\frac{1}{4}$ i $\frac{11}{8} = 1\frac{3}{8}$ m $\frac{10}{3} = 3\frac{1}{3}$
b $\frac{9}{6} = 1\frac{3}{6}$ f $\frac{7}{4} = 1\frac{3}{4}$ j $\frac{4}{3} = 1\frac{1}{3}$ n $\frac{10}{4} = 2\frac{2}{4}$
c $\frac{5}{3} = 1\frac{2}{3}$ g $\frac{7}{6} = 1\frac{1}{6}$ k $\frac{8}{3} = 2\frac{2}{3}$ o $\frac{11}{5} = 2\frac{1}{5}$
d $\frac{6}{5} = 1\frac{1}{5}$ h $\frac{9}{8} = 1\frac{1}{8}$ l $\frac{9}{4} = 2\frac{1}{4}$ p $\frac{13}{8} = 1\frac{5}{8}$

9 a–e

Transport to school
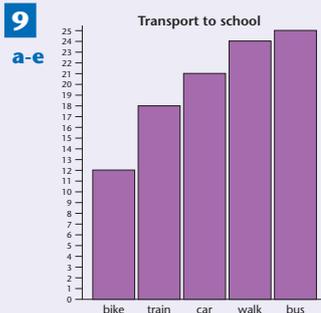
f bike g 24 h car i bus

10–11 Hands on.

12

	24-hour	Digital
a	0950	9:50 am
b	1030	10:30 am
c	1122	11:22 am
d	1207	12:07 pm
e	1325	1:25 pm
f	1454	2:54 pm
g	1525	3:25 pm
h	1636	4:36 pm
i	1854	6:54 pm
j	2006	8:06 pm

13 a 1113 b 1506 c 2032

14

	Program	Start	Finish	Duration
a	Sesame Street	0830	0900	30 min
b	Business Breakfast	0600	0830	150 min
c	ABC News	1900	1930	30 min
d	Bananas in Pyjamas	0900	1000	60 min
e	Reality Bites	1930	2100	90 min
f	Lateline	2200	2300	60 min
g	The Hoobs	1430	1530	60 min
h	World at Noon	1200	1430	150 min

Unit 7

1 a $\frac{7}{12}$ d $\frac{6}{10}$ g $\frac{4}{12}$ j $\frac{3}{6}$ m $\frac{1}{6}$
b $\frac{3}{12}$ e $\frac{3}{10}$ h $\frac{4}{12}$ k $\frac{2}{4}$ n $\frac{4}{10}$
c $\frac{3}{12}$ f $\frac{3}{8}$ i $\frac{1}{10}$ l $\frac{2}{10}$ o $\frac{1}{12}$

2 a $\frac{2}{3} + \frac{2}{3} = \frac{4}{3} = 1\frac{1}{3}$
b $\frac{7}{10} + \frac{6}{10} = \frac{13}{10} = 1\frac{3}{10}$
c $\frac{7}{8} + \frac{5}{8} = \frac{12}{8} = 1\frac{4}{8}$
d $\frac{4}{6} + \frac{3}{6} = \frac{7}{6} = 1\frac{1}{6}$
e $\frac{3}{4} + \frac{3}{4} = \frac{6}{4} = 1\frac{2}{4}$
f $\frac{7}{12} + \frac{6}{12} = \frac{13}{12} = 1\frac{1}{12}$

3 a $\frac{8}{12} + \frac{5}{12} = \frac{13}{12} = 1\frac{1}{12}$
b $\frac{9}{12} + \frac{7}{12} = \frac{16}{12} = 1\frac{4}{12}$
c $\frac{8}{12} + \frac{7}{12} = \frac{15}{12} = 1\frac{3}{12}$
d $\frac{9}{12} + \frac{6}{12} = \frac{15}{12} = 1\frac{3}{12}$
e $\frac{10}{12} + \frac{9}{12} = \frac{19}{12} = 1\frac{7}{12}$
f $\frac{11}{12} + \frac{7}{12} = \frac{18}{12} = 1\frac{6}{12}$
g $\frac{7}{12} + \frac{5}{12} = \frac{12}{12} = 1$
h $\frac{8}{12} + \frac{9}{12} = \frac{17}{12} = 1\frac{5}{12}$
i $\frac{9}{12} + \frac{9}{12} = \frac{18}{12} = 1\frac{6}{12}$

4 Hands on.

5 a 77.4**9**8 Hundredths
b **7**7.654 Ones
c 288.**6**74 Tenths
d 3**5**4.876 Tens
e **7**90.245 Hundreds
f **2**228.42 Thousands
g 345.45**6** Thousandths
h 1**2**22.54 Hundreds
i 26.**9**84 Tenths
j 136.7**8**6 Hundredths
k **2**346.354 Thousands
l 4567.78**2** Thousandths

6

	Centimetres	Fraction of a metre	Decimal fraction
a	10 cm	$\frac{10}{100}$	0.1 m
b	90 cm	$\frac{90}{100}$	0.9 m
c	70 cm	$\frac{70}{100}$	0.7 m
d	80 cm	$\frac{80}{100}$	0.8 m
e	30 cm	$\frac{30}{100}$	0.3 m
f	150 cm	$\frac{150}{100}$	1.5 m
g	520 cm	$\frac{520}{100}$	5.2 m
h	350 cm	$\frac{350}{100}$	3.5 m
i	210 cm	$\frac{210}{100}$	2.1 m
j	825 cm	$\frac{825}{100}$	8.25 m

7 a 0.36 m, 0.65 m, 0.75 m, 0.8 m
b 0.071 km, 0.7 km, 0.92 km, 0.973 km
c 3.005 L, 3.05 L, 3.26 L, 3.512 L
d 0.007 kg, 0.352 kg, 0.48 kg, 0.5 kg
e 7.63, 8.36, 9.013, 35.65
f 1.979, 2.003, 3.002, 3.2
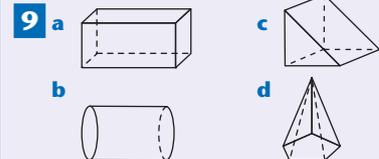
8 a 0.21, 0.24, 0.27
b 0.28, 0.32, 0.36
c 0.45, 0.51, 0.57
d 1.26, 1.29, 1.32
e 2.51, 2.55, 2.59
f 5.76, 5.79, 5.82

9 a c
b d

10–11 Hands on.

12 a 12 m b 12 m c 12 m

13 B = 4 m × 3 C = 5 m × 2 + 2 m

14 a 15 cm d 30 cm g 12 m
b 24 cm e 21.5 m h 18 cm
c 26 cm f 56 cm

15 Polygons A, B, D, F, H

16 a 48 cm b 15 cm c 100 cm

17 Hands on (One example is a decagon with 4-cm sides).

Unit 8

1 a 17 304 d 13 916 g 21 445 j 28 592
b 22 972 e 37 735 h 33 642
c 8295 f 36 144 i 69 232

2 a 9 b 8 c 7 d 5 e 9

3 a $2285 c 2250 m further.
b 31 752 m d No—$5.50 short.

4 Hands on.

5 a 117 590 e 155 414 i 4994
b 174 648 f 57 066 j 36 272
c 147 951 g 19 131
d 228 255 h 31 116
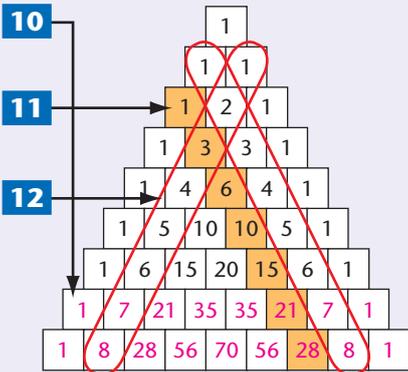
6 Car, motorcycle, sunglasses, speedboat, pool.

7 Hands on.

8

1	⎫ +2
3	⎬ +3
6	⎭ +4
10	
15	
21	
28	
36	
45	
55	
66	
78	
91	
105	
120	
136	
153	
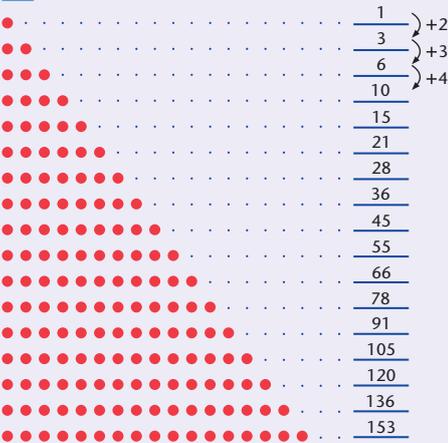
9 a 171 b 190 c 210 d 231

10 **11** **12**
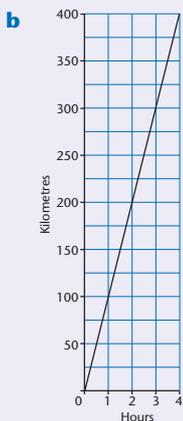
13

1	1	2	3	5	8	13	21	34	55

14 a $5\frac{1}{2}$ hrs b 50 km c 1 hr
d 150 km e 10:30 am f 300 km
g 8 am

15 a $1\frac{1}{2}$ hours **16** b

b

Unit 9

1 a 531 d 991 g 462r5 j 668r3
b 631 e 671 h 487r4
c 682 f 550r4 i 755

2 a 8 b 9 c 8 d 6 e 7

3 a 943 m c 1139 m e 1073r4 m
b 1371r1 m d 1502 m

---

4 Hands on.

5 Circled prime numbers — 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97 — all other numbers are shaded composite numbers.

6 a No c Yes e No g Yes
b Yes d Yes f No h Yes

7 a Ninety thousand dollars.
b One million and five hundred thousand dollars.
c One thousand, nine hundred and ninety-five.
d One thousand and five hundred metres.
e Twenty-one dollars and fifty cents.

8 a No b Hands on.

9 a No b Hands on.

10 a No b Hands on. c Hands on (Yes).
d Hands on. (Having a greater sample size improves accuracy.)

11 a Morning g Evening
b Morning h Hands on
c Afternoon i 60
d Hands on j 35
e Afternoon k 35
f Afternoon l Discussion

DIAGNOSTIC REVIEW 1

Part 1

a 36 240, 36 242
b 407 204, 407 206
c 7641, 7643
d 2 628 699, 2 628 701
e 74 533 908, 74 533 910
f 2 872 101

Part 2

a 84 000
b 12 000
c 100 000
d 44 000
e 90 000
f 757 000
g 958 866
h 333 323
i 680 723
j 230 000
k $443 394
l Shade 2, 3, 5, 7, 11, 13, 17, 19

Part 3

a 200 h 128 o 28 296
b 2000 i ≈ 360 p 603
c 210 j ≈ 400 q 1432
d 2100 k ≈ 1200 r 2136
e 48 l ≈ 2100 s 1231
f 96 m 1086
g 64 n 33 215

Part 4
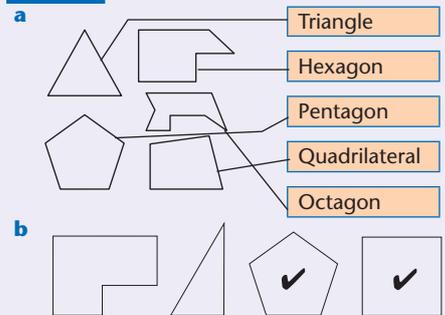
	Fraction	Decimal	%
a	$\frac{27}{100}$	0.27	27%
b	$\frac{99}{100}$	0.99	99%
c	$\frac{70}{100}$	0.70	70%
d	$\frac{6}{100}$	0.06	6%

e $\frac{5}{8}$ f $\frac{3}{12}$ g $\frac{7}{10}$ h $\frac{13}{10} = 1\frac{3}{10}$
i $\frac{6}{10}$ j $\frac{6}{5} = 1\frac{1}{5}$ k $\frac{4}{10}$ l $\frac{12}{8} = 1\frac{4}{8}$

Part 5

a 82.95 km b 33.11 m c 24.18 kg

Part 6

a

| Triangle |
| Hexagon |
| Pentagon |
| Quadrilateral |
| Octagon |

b

Part 7

	Object	Faces	Vertices	Edges
a		6	8	12
b		5	5	8
c		5	6	9

Part 8

a 130° b 45°

Part 9

150 mm

Part 10

a 16 cm² b 12 cm²

Part 11

a	Brent	23:28	23:45
b	Daly	23:32	23:49
c	Levy	23:36	23:53
d	Gena	23:40	23:57
e	Moss	23:44	00:01
f	Hale	23:48	00:05
g	Tilga	23:52	00:09
h	Roko	23:56	00:13

Part 12

a 10°C c Approximately 12.5°C
b 15°C

Answers

Unit 10

1 **a** 33 000   **c** 48 000
   b 91 000   **d** 137 000

2 Exact answers
   a 31 542   **d** 28 421   **g** 124 945
   b 103 784   **e** 92 052   **h** 65 201
   c 140 637   **f** 47 683

3 **a** Exact. She needs to know how much she owes.
   b Approximate: Anything over $8500 for the car is more than he can afford.

4 **a**
$$\frac{5}{10} + \frac{3}{10} = \frac{8}{10}$$
   b
$$\frac{11}{12} - \frac{5}{12} = \frac{6}{12}$$
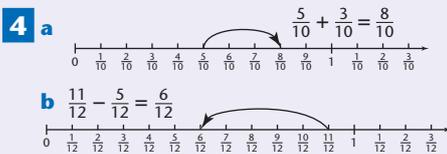
5 **a** $\frac{4}{5}$ **d** $\frac{2}{4}$ **g** $\frac{5}{8}$ **j** $\frac{5}{10}$ **m** $\frac{3}{5}$
   b $\frac{7}{8}$ **e** $\frac{3}{10}$ **h** $\frac{2}{6}$ **k** $\frac{7}{10}$ **n** $\frac{10}{12}$
   c $\frac{2}{3}$ **f** $\frac{8}{10}$ **i** 1 **l** $\frac{7}{10}$ **o** $\frac{8}{12}$

6 **a** $\frac{11}{8} = 1\frac{3}{8}$ **c** $\frac{12}{8} = 1\frac{4}{8}$ **e** $\frac{11}{8} = 1\frac{3}{8}$
   b $\frac{12}{8} = 1\frac{4}{8}$ **d** $\frac{11}{8} = 1\frac{3}{8}$ **f** $\frac{10}{8} = 1\frac{2}{8}$

7 **a** $\frac{6}{4} = 1\frac{2}{4}$ **e** $\frac{9}{6} = 1\frac{3}{6}$ **i** $\frac{17}{10} = 1\frac{7}{10}$
   b $\frac{7}{5} = 1\frac{2}{5}$ **f** $\frac{14}{8} = 1\frac{6}{8}$ **j** $\frac{25}{10} = 2\frac{5}{10}$
   c $\frac{8}{5} = 1\frac{3}{5}$ **g** $\frac{14}{10} = 1\frac{4}{10}$ **k** $\frac{9}{4} = 2\frac{1}{4}$
   d $\frac{4}{3} = 1\frac{1}{3}$ **h** $\frac{15}{10} = 1\frac{5}{10}$ **l** $\frac{9}{5} = 1\frac{4}{5}$

8 **a** 182 km   **d** 247 km   **g** 295 km
   b 166 km   **e** 324 km   **h** 81 km
   c 253 km   **f** 429 km.

9 **a** 3077 km   **b** $2919.60   **c** 4474 km

10–11 Hands on.

Unit 11

1 **a** 28.333   **e** 62.252   **i** 977.385
   b 368.56   **f** 91.514   **j** 792.946
   c 425.96   **g** 105.461
   d 83.502   **h** 129.256

2 **a** 15.212   **c** 14.456   **e** 23.812
   b 64.341   **d** 14.626

3 **a** 3.792 kg   **d** 1.671 m
   b 256.36 km   **e** 0.432 t
   c 140.5 km   **f** $304.35

4 **a** 6   **b** 4   **c** 12   **d** 3   **e** 8   **f** 2

5 **a** 20   **d** 120   **g** 700
   b 30   **e** 60   **h** 200
   c 50   **f** 160   **i** 100

6 **a** 180
   b 90
   c 60
   d 30

Pie chart: Baby Animals, Under water, Reptile, Monkey

7 **a** 400   **b** 400   **c** 3150   **d** 65

8 Possible solutions $\frac{1}{3}$ of 180, $\frac{1}{4}$ of 240, $\frac{1}{5}$ of 300.

9 **a** T   **c** T   **e** F   **g** T
   b T   **d** T   **f** T   **h** T

10

Ashley's mass from 2 years to 12 years

11

Echo	Corolla	Commodore	Patrol	Landcruiser
0.890 t	1.146 t	1.526 t	2.371 t	2.413 t

12 **a** 42 kg   **c** 380 kg
   b 887 kg   **d** 256 kg

13 **a** 10   **b** 4   **c** 40   **d** 5   **e** 200

14 **a** 5000 kg   **d** 5500 g   **g** 4999 kg
   b 3500 kg   **e** 7300 g   **h** 6123 kg
   c 10 000 kg   **f** 2500 g   **i** 9505 kg

Unit 12

1 **a** 25   **c** 70   **e** 38
   b 77   **d** 36   **f** 26

2 **a** 20   **d** 29   **g** 125
   b 78   **e** 28   **h** 134
   c 14   **f** 36   **i** 126

3 **a** 48   **d** 37   **g** 84
   b 94   **e** 128   **h** 74
   c 5   **f** 141   **i** 280

4 **a** 99   **d** 175   **g** 44
   b 127   **e** 92   **h** 259
   c 35   **f** 95   **i** 187

5 **a** 19.8   **d** 30   **g** 29
   b 18.5   **e** 6   **h** 9
   c 36   **f** $7\frac{1}{4}$ **i** 0

6 30. The bracket must be done first.

7

%	1%	10%	20%	25%	50%	100%
Dec	0.01	0.10	0.20	0.25	0.50	1
Frac.	$\frac{1}{100}$	$\frac{10}{100}/\frac{1}{10}$	$\frac{20}{100}/\frac{1}{5}$	$\frac{25}{100}/\frac{1}{4}$	$\frac{50}{100}/\frac{1}{2}$	$\frac{100}{100}$

8 **a** $8   **b** 40   **c** 6   **d** 4   **e** 45

9 **a** 5 sheep   **e** 50 mice
   b 4 lambs   **f** 45 chickens
   c 8 cattle   **g** 16 ducks
   d 25 geese   **h** 24 sheep

10 **a–c** Hands on—one possible solution:

   d 15%

11 Hands on.
   a square   **c** rectangle
   b rhombus   **d** parallelogram

12–13 Hands on.

14 **a** T   **b** T   **c** F   **d** T   **e** T   **f** F

Unit 13

1 **a** 7.46   **e** 41.503   **h** $835.74
   b 2.181   **f** 49.991   **i** 1185.25
   c 1.611   **g** 19.308   **j** 660.26
   d 18.625

2 **a** $ 64.90   **d** $ 111.10   **g** $ 134.80
   b $ 176.05   **e** $ No   **h** $ 240.95
   c $ 120.25   **f** $ 90.20

3 $30.10 and $69.90 = $100—she got the correct change.

4 **a** 227 386
   $200\,000 + 20\,000 + 7000 + 300 + 80 + 6$
   b 576 491
   $500\,000 + 70\,000 + 6000 + 400 + 90 + 1$
   c 963 237
   $900\,000 + 60\,000 + 3000 + 200 + 30 + 7$
   d 425 310
   $400\,000 + 20\,000 + 5000 + 300 + 10$
   e 240 300
   $200\,000 + 40\,000 + 300$
   f 780 407
   $700\,000 + 80\,000 + 400 + 7$
   g 6 029 256
   $6\,000\,000 + 20\,000 + 9000 + 200 + 50 + 6$

5 **a** 356 257 Three hundred and fifty-six thousand, two hundred and fifty-seven
   b 479 807 Four hundred and seventy-nine thousand, eight hundred and seven
   c 906 007 Nine hundred and six thousand and seven
   d 4 274 300 Four million, two hundred and seventy-four thousand, three hundred
   e 27 360 027 Twenty-seven million, three hundred and sixty thousand and twenty-seven

6 Hands on.

7 **a** 764 319   **b** 7 034 069

8 Hands on and discussion.
  a Not credible (the survey was conducted in a place where a bias towards Rocket Sports Drink is likely to exist).
  b Not credible (the children surveyed in a bookstore are not likely to be representative of the general population).
  c Not credible (whilst this is true, the heading may be seen as misleading as it does not give the same impression of gender ratios that was elicited by the census).

9 a Graph A
  b Graph A only represents a minor increase over five days.

10 a 6 km   **e** 2 km   **i** 10 km
  b 6 km   **f** 7 km   **j** 3 km
  c 4 km   **g** 11 km   **k** 8 km
  d 10 km   **h** 6 km

11 Hands on—suggested answers:
  a 8 km   **b** 9 km   **c** 3 km   **d** 9 km

12 a 9.154 km   **e** 10.956 km
  b 6.729 km   **f** 15.638 km
  c 7.935 km   **g** 19.006 km
  d 5.629 km   **h** 14.1 km

13 a 3000 m   **d** 1.5 km
  b 350 cm   **e** 325 cm
  c 5 km   **f** 275 cm

14 325 749 km

Unit 14

1 a 37815   **f** 12642   **k** 31734
  b 9416   **g** 37800   **l** 48072
  c 34074   **h** 25053   **m** 49350
  d 10024   **i** 51264   **n** 27540
  e 17900   **j** 12582   **o** 72063

2 a
$$2\,3\,5\,5 \times 6 = 1\,4\,1\,3\,0$$
  c
$$7\,5\,0\,9 \times 8 = 6\,0\,0\,7\,2$$
  e
$$7\,2\,6\,4 \times 6 = 4\,3\,5\,8\,4$$
  b
$$3\,6\,2\,4 \times 5 = 1\,8\,1\,2\,0$$
  d
$$6\,5\,2\,3 \times 7 = 4\,5\,6\,6\,1$$

3 a 2384   **c** 5416
  b 2272 m²   **d** $14152

4 Hands on. (14 296)

5 a T   **c** T   **e** F   **g** F   **i** F   **k** F
  b F   **d** F   **f** F   **h** F   **j** T   **l** T

6 a $\frac{2}{4}$ **c** $\frac{2}{6}$ **e** $\frac{3}{12}$ **g** $\frac{6}{12}$ **i** $\frac{8}{12}$ **k** $\frac{4}{6}$
  b $\frac{2}{8}$ **d** $\frac{4}{12}$ **f** $\frac{9}{12}$ **h** $\frac{6}{8}$ **j** $\frac{3}{12}$ **l** $\frac{4}{6}$

7 Hands on. Some examples below.
  a $\frac{2}{8}, \frac{3}{12}, \frac{4}{16}, \frac{5}{20}, \frac{6}{24}$ **c** $\frac{2}{6}, \frac{3}{9}, \frac{4}{12}, \frac{5}{15}, \frac{6}{18}$
  b $\frac{6}{20}, \frac{9}{30}, \frac{12}{40}, \frac{15}{50}, \frac{18}{60}$ **d** $\frac{2}{10}, \frac{3}{15}, \frac{4}{20}, \frac{5}{25}, \frac{6}{30}$

---

8 Hands on.

9 a 54 composite   **l** 66 composite
  b 80 composite   **m** 76 composite
  c 64 composite   **n** 98 composite
  d 81 composite   **o** 63 composite
  e 71 prime   **p** 65 composite
  f 83 prime   **q** 67 prime
  g 99 composite   **r** 69 composite
  h 77 composite   **s** 73 prime
  i 93 composite   **t** 75 composite
  j 97 prime   **u** 79 prime
  k 86 composite

10

Divisor	Number				
2	14	100	248	152	2157
3	18	396	67	225	1233
4	28	112	1442	1347	3856
5	50	275	171	2275	4723
8	68	248	1480	2344	1560
9	83	135	3348	3448	2557
10	997	990	1040	3395	10 000

(rows **a**–**g**)

11–13 Hands on.

14

  a   **b**   **c**

15
  a To the right   **b** To the left   **c** Directly above   **d** Directly below

16

  a   **c**   **e**
  b   **d**   **f**

17 Rotate 90°, translate, rotate 90°, translate, rotate 90°, translate, rotate 90°, translate

Unit 15

1

2

3

---

4 a $\frac{1}{8}, \frac{1}{4}, \frac{1}{2}$ **e** $1\frac{7}{8}, 2\frac{1}{8}, 2\frac{1}{2}$
  b $\frac{1}{4}, \frac{1}{3}, \frac{1}{2}$ **f** $1\frac{1}{4}, 1\frac{3}{8}, 1\frac{3}{4}$
  c $\frac{3}{8}, \frac{6}{8}, \frac{7}{8}$ **g** $1\frac{3}{5}, 1\frac{3}{4}, 2\frac{1}{5}$
  d $\frac{1}{4}, \frac{1}{2}, \frac{7}{8}$ **h** $1\frac{3}{10}, 1\frac{1}{2}, 1\frac{3}{5}$

5 a $1\frac{3}{4}, 2, 2\frac{1}{4}$ $\boxed{+\frac{1}{4}}$ **c** $8, 7\frac{1}{2}, 7$ $\boxed{-\frac{1}{2}}$
  b $3\frac{1}{4}, 3\frac{3}{4}, 4\frac{1}{4}$ $\boxed{+\frac{2}{4}}$ **d** $7, 6\frac{3}{4}, 6\frac{1}{2}$ $\boxed{-\frac{1}{4}}$

6 Hands on.

7 a 900   **c** 200   **e** 0   **g** 300
  b 900   **d** 500   **f** 800   **h** 200
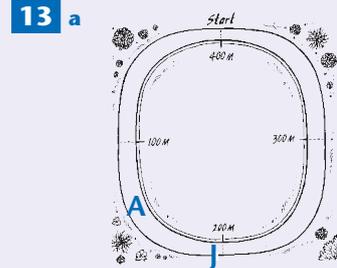
8 a 30 000   **d** 12 000   **g** 36 000
  b 25 000   **e** 16 000   **h** 25 000
  c 64 000   **f** 42 000

9 a 15   **c** 28   **e** 8   **g** 4
  b 48   **d** 24   **f** 4   **h** 7

10 a 7 k   **d** 13 k   **g** 336 k
  b 3 k   **e** 27 k   **h** 474 k
  c 9 k   **f** 18 k   **i** 556 k
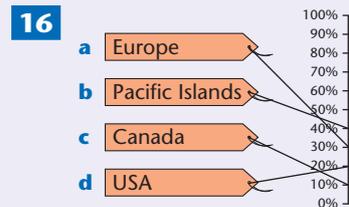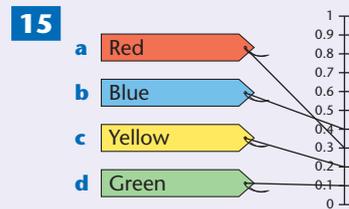
11 a 3 k   **d** 15 k   **g** 41 k   **j** 65 k
  b 6 k   **e** 11 k   **h** 45 k
  c 10 k   **f** 33 k   **i** 43 k

12 a Bluey—80 km × $2\frac{1}{2}$ = 200 km.
  b $\frac{1}{2}$ day—$70 < ($25 × 3).
  c $90—($10 × 6 × $1\frac{1}{2}$).

13 a

  b 100 metres
  c Josh 150 seconds. Andrew 200 seconds.

14 Hands on.

15

  a Red   **b** Blue   **c** Yellow   **d** Green

16

  a Europe   **b** Pacific Islands   **c** Canada   **d** USA

17 Hands on.

Unit 16

1   **a** $1416\frac{2}{3}$ **b** $1414\frac{1}{4}$ **c** $1311\frac{2}{5}$
    d $1312\frac{2}{6}$ **e** $1341\frac{3}{4}$ **f** $1253\frac{5}{6}$
    g $1419\frac{2}{4}$ or $\frac{1}{2}$ **h** $1479\frac{2}{5}$ **i** 1825
    j $1281\frac{4}{6}$

2   **a** 1219.25   **b** 1384.25   **c** 1321.75
    d 1485.4   **e** 1709.2   **f** 1281.4
    g 707.25   **h** 2417.5

3   **a** 187   **b** 195   **c** 47   **d** 62.8

4

Across	Down
1 $123 \div 3 = 41$	2 $252 \div 2 = 126$
3 $296 \div 8 = 37$	3 $160 \div 5 = 32$
4 $924 \div 2 = 462$	5 $705 \div 3 = 235$
6 $384 \div 6 = 64$	6 $882 \div 7 = 126$
8 $381 \div 3 = 127$	9 $469 \div 7 = 67$
10 $64 \div 8 = 8$	12 $858 \div 6 = 143$
11 $855 \div 5 = 171$	14 $150 \div 10 = 15$
13 $729 \div 9 = 81$	16 $640 \div 8 = 80$
15 $288 \div 4 = 72$	
17 $840 \div 4 = 210$	
18 $581 \div 7 = 83$	

5   **a** $\frac{3}{10}$ **d** $\frac{3}{8}$ **g** $\frac{7}{10}$ **j** $\frac{4}{6}$ **m** $\frac{7}{10}$ **p** $\frac{5}{12}$
    b $\frac{5}{10}$ **e** $\frac{10}{12}$ **h** $\frac{3}{6}$ **k** $\frac{4}{12}$ **n** $\frac{7}{12}$ **q** $\frac{2}{12}$
    c $\frac{6}{10}$ **f** $\frac{7}{12}$ **i** $\frac{8}{10}$ **l** $\frac{4}{6}$ **o** $\frac{3}{10}$ **r** $\frac{3}{10}$

6   **a** $\frac{7}{6} = 1\frac{1}{6}$ **g** $\frac{13}{10} = 1\frac{3}{10}$ **m** $\frac{12}{10} = 1\frac{2}{10}$
    b $\frac{11}{10} = 1\frac{1}{10}$ **h** $\frac{14}{12} = 1\frac{2}{12}$ **n** $\frac{18}{12} = 1\frac{6}{12}$
    c $\frac{11}{8} = 1\frac{3}{8}$ **i** $\frac{9}{6} = 1\frac{3}{6}$ **o** $\frac{7}{6} = 1\frac{1}{6}$
    d $\frac{13}{8} = 1\frac{5}{8}$ **j** $\frac{15}{10} = 1\frac{5}{10}$ **p** $\frac{12}{10} = 1\frac{2}{10}$
    e $\frac{13}{10} = 1\frac{3}{10}$ **k** $\frac{15}{12} = 1\frac{3}{12}$ **q** $\frac{17}{12} = 1\frac{5}{12}$
    f $\frac{11}{8} = 1\frac{3}{8}$ **l** $\frac{11}{8} = 1\frac{3}{8}$ **r** $\frac{17}{12} = 1\frac{5}{12}$

7   **a**
    b

Triangles	1	2	3	4	5	6	7
Matches	3	6	9	12	15	18	21

    c Hands on (triangles × 3 = matches).
    d 45

8   **a**
    b

Pentagons	1	2	3	4	5	6	7
Sides	5	10	15	20	25	30	35

    c Hands on (pentagons × 5 = sides).
    d 50

9   **a**
    b

Squares	1	2	3	4	5	6	7
Sides	4	8	12	16	20	24	28

    c Hands on (squares × 4 = sides).
    d 48

10   Matches = triangles × 2 + 1

11–12   Hands on (possible solutions).

Shape	Length	Width	Height	Volume	Order
a	5	2	3	30 cm³	2
b	4	2	4	32 cm³	3
c	2	2	4	16 cm³	1
d	5	2	4	40 cm³	4
e	10	3	4	120 cm³	7
f	8	3	3	72 cm³	5
g	7	4	4	112 cm³	6

13   **a** 8   **b** 64

Unit 17

1   Hands on.

2

$$\begin{array}{r} 2\ 3\ 4 \\ \times\quad 2\ 3 \\ \hline 7\ 0\ 2 \\ 4\ 6\ 8\ 0 \\ \hline 5\ 3\ 8\ 2 \end{array}$$

234 × 3 ones = 702
234 × 2 tens = 4680
702 + 4680 = 5382

3   **a** 8928   **d** 11102   **g** 27630   **j** 3672
    b 5850   **e** 20808   **h** 4896
    c 10778   **f** 9982   **i** 14529

4   **a** $3264   **c** $16284
    b $6795   **d** $9936

5   **a** rule ×20   **b** 200

20	40	60	80	100	120	140

    c rule ×15   **d** 180

15	30	45	60	75	90	105

    e rule ×13   **f** 195

13	26	39	52	65	78	91

    g rule ×12   **h** 144

12	24	36	48	60	72	84

6   **a** 3 minutes
    b 225 m
    c 125 m
    d Hands on.
    e Hands on. Hansel drawn at E.
    f 3 minutes

7   **a–e** Hands on   **f**
    g 2
    h 2

8   **a** Hands on   **b**
    c Yes
    d 4

9   **a** 3.563 t   **e** 8.504 t   **i** 0.356 t
    b 7.462 t   **f** 23.034 t   **j** 0.742 t
    c 8.754 t   **g** 6.705 t   **k** 0.086 t
    d 6.077 t   **h** 50.267 t   **l** 0.006 t

10   **a** 500   **b** 250   **c** 125

11   **a** kg   **c** g   **e** mg   **g** t   **i** kg
    b t   **d** kg   **f** mg   **h** g   **j** g

12   **a** 5000 kg   **e** 2500 g   **i** 3000 mg
    b 2500 kg   **f** 1500 g   **j** 2 g
    c 2000 g   **g** 500 g   **k** 3.5 kg
    d 6000 g   **h** 1000 mg   **l** 2.25 t

13   **a** 790 g   **c** 200 g
    b 16 sacks   **d** 5.075 t. No

Unit 18

1   **a** 9   **d** 4   **g** 27   **j** 21   **m** 10
    b 12   **e** 6   **h** 30   **k** 18
    c 3   **f** 24   **i** 15   **l** 33

2   **a** 20   **d** 18   **g** 100   **j** 120   **m** 70
    b 60   **e** 30   **h** 360   **k** 140   **n** 60
    c 40   **f** 80   **i** 180   **l** 100   **o** 84
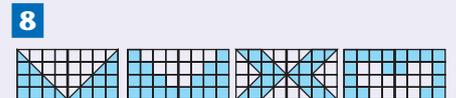
3   **a** $300   **c** $100
    b $70   **d** 72 marbles
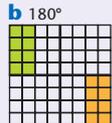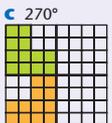
4   **a** $20   **c** $20   **e** $5
    b $15   **d** $20   **f** $200

5   Hands on.

6
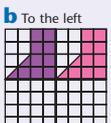
	Estimate	Answer
a	2600	647 km + 1952 km = 2599 km
b	2000	1381 km + 610 km = 1991 km
c	2000	1305 km + 674 km = 1979 km
d	2000	970 km + 951 km = 1921 km
e	1500	951 km + 470 km = 1421 km
f	1100	610 km + 470 km = 1080 km
g	1700	1091 km + 616 km = 1707 km

7   Hands on.

8

9   **a** 90°   **b** 180°   **c** 270°

10

   a Directly below   **b** To the left   **c** Directly above   **d** To the right

    e No

11–12   Hands on.

13   **a–d** Hands on.
    e One cubic centimetre displaces one millilitre of water.

14   100 centicubes

Answers

DIAGNOSTIC REVIEW 2

Part 1

a 93.116
b 98.257
c 8.384
d 13.465
e 2.418 m

Part 2

a 14104
b 16470
c 29216
d $258\frac{2}{8}$
e $1122\frac{3}{7}$
f $430\frac{8}{9}$
g $1291\frac{2}{6}$
h $755\frac{2}{5}$
i $901\frac{1}{4}$

Part 3

a 12
b 14
c 50
d 30
e 300
f 700
g 5 m
h 20 m
i 20%

Part 4

a 27
b 47
c 39
d 86
e 83
f 100

Part 5

a

First No.	1	2	3	4	5	6	7
Second No.	6	12	18	24	30	36	42

Rule multiply by 6.

Part 6

a Prime
b Prime
c Composite
d Composite
e
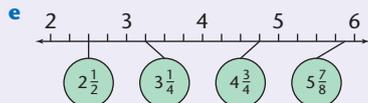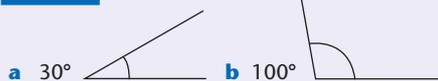
f $2\frac{1}{4}$, $2\frac{3}{4}$, $3\frac{1}{2}$

Part 7

a $\frac{12}{8} = 1\frac{4}{8}$
b $\frac{12}{10} = 1\frac{2}{10}$
c $\frac{12}{10} = 1\frac{2}{10}$
d $\frac{22}{10} = 2\frac{2}{10}$
e $\frac{9}{8} = 1\frac{1}{8}$
f $\frac{12}{5} = 2\frac{2}{5}$
g $\frac{5}{12}$
h $\frac{6}{10}$
i $\frac{3}{12}$
j $\frac{4}{6}$
k $\frac{2}{4}$
l $\frac{4}{8}$

Part 8

Part 9

a 30°
b 100°

Part 10
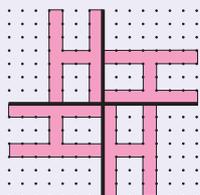
Part 11

a 6000 kg
b 2515 kg
c 4.658 t
d 3.496 t

Part 12

a 16 cm³
b 24 cm³
c

Part 13

50 mL

Part 14

a $30
b $20
c $150
d $30
e Hands on (each consecutive month, 10 more dollars are saved).

Unit 19

1

	Estimate	Answer
a	15 000	14 969
b	37 000	37 186
c	12 000	12 050
d	17 000	17 582
e	25 000	24 349

2
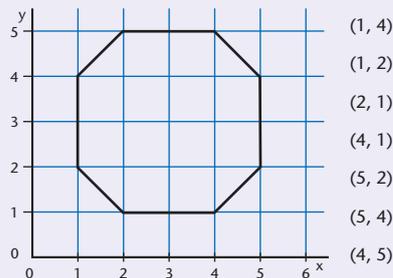
	Estimate	Answer
a	500 000	549 839
b	500 000	454 053
c	300 000	337 569
d	100 000	80 662
e	200 000	258 475
f	300 000	366 166
g	600 000	589 457
h	300 000	327 818

3 Hands on.

4
a 29 years
b 145
c 42.94 m
d 4599 t
e 1465 t
f 3.76 m

5 a

(2, 5)
(1, 4)
(1, 2)
(2, 1)
(4, 1)
(5, 2)
(5, 4)
(4, 5)

b

(4, 5)
(2, 5)
(1, 3)
(2, 1)
(4, 1)
(5, 3)
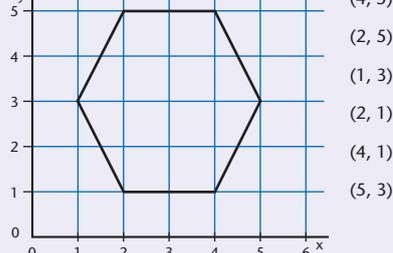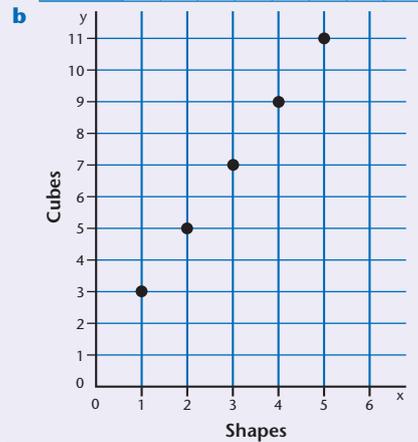
6 a

Shapes	1	2	3	4	5	6	7	8
Cubes	3	5	7	9	11	13	15	17

b

7 19 cubes.

8
a 13.6 kg
b 22.5 m
c 18.4 kg
d 26 m
e 21.6 kg
f 18.69 m
g 28.72 kg
h 41.05 m
i 22.29 kg
j 31.44 m
k 136.5 kg
l 146.8 m
m 289.8 kg
n 58.4 m
o 158.5 kg
p 151.38 m
q 106.45 kg
r 190.92 m
s 519.61 kg
t 123.75 m

9
a $21 | $21.70
b $40 | $39.50
c $18 | $17.94
d $108 | $108.45
e $180 | $179.40

10
a 10:30 am
b 12:47 pm
c 45 min
d 6:20 pm
e No

11
a $48.50
b $12.50
c $20

Unit 20

1
a 10 800; 10 800
b 4498; 4498
c 4446; 13 356
d 22 464; 22 464
e 14 790; 46 920
f 34 086; 34 086
g 23 978; 23 978
h 33 448; 18 796
i 7826; 18 662
j 42 768; 9504

2 Strategy 2—Explanation, hands on.

3 Possible order:
a 25 × 4 × 16 = 1600
b 20 × 5 × 18 = 1800
c 13 × 2 × 10 = 260
d 2 × 50 × 43 = 4300
e 4 × 5 × 38 = 760

4
a $60
b $54
c $6 000—strategies, hands on.

5
a Hands on.

6
a $23 400
b $2000
c $4000
d $1660
e $12 000
f 10%
g $2500
h $23 958.34

7 25% is larger. $\frac{1}{5}$ is equal to 20%.

8 $20 000

9
- **a** XVIII
- **b** XXXIX
- **c** XLVI
- **d** LVIII
- **e** XLVII
- **f** XCVI
- **g** XCIX
- **h** CXXVII
- **i** CXXXVI
- **j** CCLXIII
- **k** CCCXLVI
- **l** DLXXXIV
- **m** DCLIV
- **n** DCLXI
- **o** DCCXXV
- **p** MCXXV
- **q** MCCCXXVI
- **r** MMCLXXXI

10

	Height	Year
a	55 m = LV	1350 = MCCCL
b	76 m = LXXVI	1631 = MDCXXXI
c	93 m = XCIII	1884 = MDCCCLXXXIV
d	96 m = XCVI	1870 = MDCCCLXX
e	300 m = CCC	1889 = MDCCCLXXXIX
f	135 m = CXXXV	1932 = MCMXXXII
g	68 m = LXVIII	1973 = MCMLXXIII
h	555 m = DLV	1975 = MCMLXXV

11
- **a** CXXIII
- **b** XIX
- **c** CCV
- **d** CCCXXXIX
- **e** DCCCLXXXVII
- **f** CDXXXIII

12
- **a** Bangkok
- **b** New York
- **c** Bangkok
- **d** Beijing
- **e** 4°C
- **f** 15°C
- **g** Darwin
- **h** New York

13
- **a** 12°C
- **b** 6°C
- **c** 8°C
- **d** 11°C
- **e** 6°C
- **f** 11°C

14 26°C   **15** 14°C   **16** 20°C

Unit 21

1
- **a** 870
- **b** 12 584
- **c** 29 422
- **d** 8064
- **e** 4640
- **f** 4224
- **g** 8748
- **h** 37 145
- **i** 49 068
- **j** 53 562
- **k** 9216
- **l** 6103
- **m** 7672
- **n** 5265
- **o** 13 083

2 $1477

3

Across
1 16 × 24 = 384
3 36 × 41 = 1476
5 9 × 12 = 108
6 53 × 13 = 689
8 15² = 225
10 14² = 196
12 123 × 8 = 984
13 7 × 9 = 63

Down
2 16 × 28 = 448
4 27² = 729
5 75 × 15 = 1125
7 79 × 11 = 869
9 6 × 99 = 594
10 12² = 144
11 6 × 11 = 66
14 12 × 3 = 36
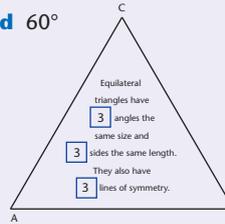
4 **a** $\frac{2}{8}$ **b** $\frac{6}{10}$

5
- **a** $\frac{5}{20}$
- **b** $\frac{3}{15}$
- **c** $\frac{4}{40}$
- **d** $\frac{2}{12}$
- **e** $\frac{9}{12}$
- **f** $\frac{8}{20}$
- **g** $\frac{4}{12}$
- **h** $\frac{15}{50}$
- **i** $\frac{6}{24}$
- **j** $\frac{6}{16}$
- **k** $\frac{60}{100}$
- **l** $\frac{16}{20}$

6
- **a** $\frac{2}{4}, \frac{3}{6}, \frac{4}{8}, \frac{5}{10}, \frac{6}{12}$
- **b** $\frac{2}{6}, \frac{3}{9}, \frac{4}{12}, \frac{5}{15}, \frac{6}{18}$
- **c** $\frac{2}{8}, \frac{3}{12}, \frac{4}{16}, \frac{5}{20}, \frac{6}{24}$
- **d** $\frac{2}{10}, \frac{3}{15}, \frac{4}{20}, \frac{5}{25}, \frac{6}{30}$

7
- **a** true
- **b** true
- **c** true
- **d** true
- **e** false
- **f** false
- **g** true
- **h** true

8 **a–c** Hands on.   **d** 60°

Equilateral triangles have 3 angles the same size and 3 sides the same length. They also have 3 lines of symmetry.

9 **a–c** Hands on.   **d** 40°

Isosceles triangles have 2 sides the same length and 2 angles the same size. They have only 1 line of symmetry.

10 **a–c** Hands on.   **d** 65°

Scalene triangles have 0 angles the same and 0 sides the same length. They also have 0 lines of symmetry.
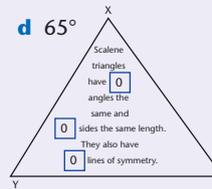
11 Hands on.

12
- **a** 60 mm
- **b** 800 cm
- **c** 5000 m
- **d** 180 mm
- **e** 5500 cm
- **f** 11 000 m
- **g** 55 mm
- **h** 250 cm
- **i** 9500 m
- **j** 115 mm
- **k** 425 cm
- **l** 8300 m
- **m** 6 cm
- **n** 5 m
- **o** 4 km
- **p** 1 m
- **q** 4.5 m
- **r** 9.25 km

13
- **a** 19 cm, 20 cm, 250 mm, 9 m
- **b** 290 cm, 2950 mm, 3 m, 3.1 m
- **c** 3.5 m, 4000 mm, 401 cm, 4000 cm

14 **a** 20 cm   **b** 4 cm   **c** 24 cm

Unit 22

1
- **a** 6323
- **b** 3212
- **c** 15 051
- **d** 6458
- **e** 20 620
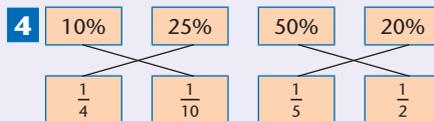
2
- **a** 425
- **b** 450 mL
- **c** 20 laps
- **d** $1094

3

R	I	X	G	L	V	O	M	N	D	I	P
906	377	104	2450	903	8356	288	107	554	873	567	281

1 3)864 = 288
2 3)1701 = 567
3 2)1134 = 567
4 5)1440 = 288
5 5)2835 = 567
6 8)4432 = 554
7 3)2619 = 873
8 9)7857 = 873
9 7)58 492 = 8356
10 8)19 600 = 2450
11 6)14 700 = 2450
12 4)3492 = 873

Secret words: G O O D D I V I D I N G

4 10% → $\frac{1}{10}$ 25% → $\frac{1}{4}$ 50% → $\frac{1}{2}$ 20% → $\frac{1}{5}$

5 **a** $4   **b** $10   **c** $25   **d** $12   **e** $5

6

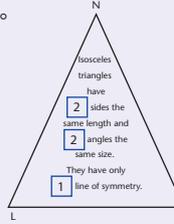|	Girl	Attempts	Success rate	Goals
a	Sam	20	25%	5
b	Julia	60	50%	30
c	Lara	50	10%	5
d	Kim	20	100%	20
e	Susie	40	25%	10
f	Tanya	30	10%	3
g	Zoe	60	25%	15
h	Trung	80	20%	16
i	Lauren	40	20%	8
j	Zena	90	10%	9

7 **a** Julia   **b** Tanya   **c** 10

8 Hands on: e.g. 20% of $200 = $40 etc.

9 **a**

Hexagons	1	2	3	4	5	6	7
Sides	6	12	18	24	30	36	42

b Number of hexagons times six equals number of sides.
c 54

10 **a**

Octagons	1	2	3	4	5	6	7
Sides	8	16	24	32	40	48	56

b Number of octagons times eight equals number of sides.
c 88

11 **a**

Decagons	1	2	3	4	5	6	7
Sides	10	20	30	40	50	60	70

b Number of decagons times ten equals number of sides.
c 150

12 **a**

Dodecagons	1	2	3	4	5	6	7
Sides	12	24	36	48	60	72	84

b Number of dodecagons times twelve equals number of sides.
c 120

13 Hands on.

14 **a** 120 mm   **c** 250 mm   **b** 140 mm   **d** 240 mm

15 Hands on.

16

	Dimensions			
	Length	Width	Perimeter	Area
a	7 cm	1 cm	16 cm	7 cm²
b	6 cm	2 cm	16 cm	12 cm²
c	5 cm	3 cm	16 cm	15 cm²
d	4 cm	4 cm	16 cm	16 cm²

17 True.

Unit 23

1

	×	10	100	1000		×	10	100	1000
a	8	80	800	8000	**g**	50	500	5000	50 000
b	18	180	1800	18 000	**h**	100	1000	10 000	100 000
c	25	250	2500	25 000	**i**	77	770	7700	77 000
d	39	390	3900	39 000	**j**	194	1940	19 400	194 000
e	10	100	1000	10 000	**k**	137	1370	13 700	137 000
f	40	400	4000	40 000	**l**	235	2350	23 500	235 000

Answers

2 a 3780   f 12150   k 122130
b 11700   g 12850   l 81540
c 14240   h 15840   m 132450
d 8100   i 43610   n 109120
e 9480   j 59600   o 101550

3 a $8000   b 12000   c $320000

4 Hands on.

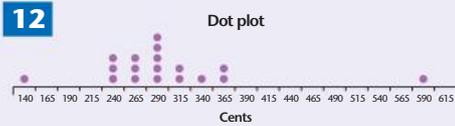5 a $13.55   c $27.40   e $188.05
b $70.75   d $89.25

6 Hands on.

7 a 533   c 379   e 88
b 164   d 38   f 1137

8 Hands on.

9 a $58   c $32.45   e $126.97
b $31.25   d $46.66   f $76.10

10 Hands on.

11 a $4.20   b $48.40

12 **Dot plot**

Cents: 140 165 190 215 240 265 290 315 340 365 390 415 440 465 490 515 540 565 590 615

13 a $2.90   c 1   e $4.50
b 2   d 3

14 Hands on ($1.40 and $5.90).

Unit 24

1 a 6.39 m   e 152.1 m   i $3600.54
b 22.38 m   f 69 m   j $2051.84
c 162.27 m   g 1645.2 m
d 143.68 m   h $2738.89

2
a	5.905 × 8	6 × 8	<48
b	7.105 × 6	7 × 6	>42
c	4.221 × 9	4 × 9	>36
d	19.878 × 8	20 × 8	<160
e	30.018 × 5	30 × 5	>150
f	14.954 × 3	15 × 3	<45

3 a $22.95   c $8.05   e $26.32
b $14.49   d $22.35   f $30.50

4 2 solutions:
7 milk $7.70   7 milk $7.70
9 cola $20.25   9 jam $18.63
$27.95 $26.33

5 ■ × 2 + 5 = ●

a
■	1	2	3	4	5	6	7	8
●	7	9	11	13	15	17	19	21

▲ × 8 + 2 = ●

b
▲	1	3	5	7	9	11	13	15
●	10	26	42	58	74	90	106	122

▲ × 2 − 10 = ■

c
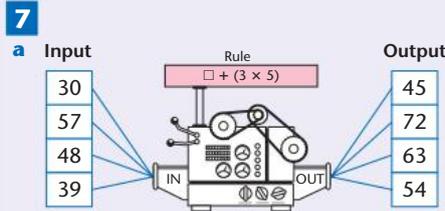| ▲	90	80	70	60	50	40	30	20
■	170	150	130	110	90	70	50	30

3 × ■ + 4 = ●

d
■	2	4	6	8	10	12	14	16
●	10	16	22	28	34	40	46	52

■ × 5 − 3 = ●

e
■	1	2	3	4	5	6	7	8
●	2	7	12	17	22	27	32	37

■ × 7 − 5 = ●

f
■	1	3	5	7	9	11	13	15
●	2	16	30	44	58	72	86	100

6 Hands on.

7
a Input: 30 57 48 39   Rule □ + (3 × 5)   Output: 45 72 63 54
b Input: 106 119 75 68   Rule □ − (17 + 3)   Output: 86 99 55 48
c Input: 51 60 87 96   Rule □ − (10 ÷ 5)   Output: 49 58 85 94
d Input: 432 108 324 180   Rule □ ÷ (2 × 3)   Output: 72 18 54 30
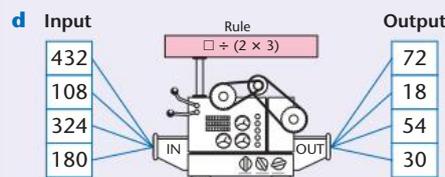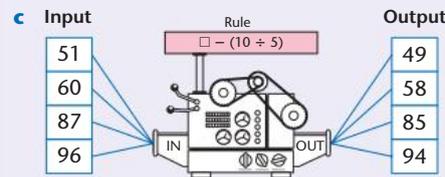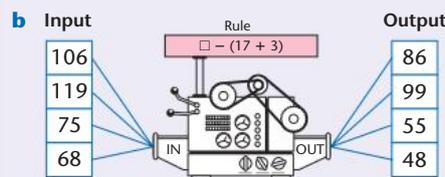
8 a 10°C   c −5°C   e 40°C   g 35°C
b 25°C   d −15°C   f −20°C

9 a 2 m   d −1 m   g 1 m
b −4 m   e 8 m   h 3 m
c 11 m   f 8 m, 13 m

10 a 9 hours
b 9 hours 30 minutes
c 3 hours 30 minutes
d 9 hours
e 9 hours 30 minutes

11 a 10 hours 30 minutes
b 13 hours 15 minutes
c 2 hours 40 minutes

12 Hands on.

Unit 25

1 a 75.44 m   f 407.21 kg   k $347.22
b 108.50 km   g 202.08 m   l $213.73
c 341.90 L   h 72.24 km   m $192.27
d 74.46 km   i 313.65 L
e 206.40 m   j $151.36

2 a 93.75 km   c 15 L
b 44.10 kg   d 126.25 sq metres

3 a 0.1, 0.2, 0.3, 0.4, 0.5, 0.6
b 0.2, 0.4, 0.6, 0.8, 1.0, 1.2
c 0.3, 0.6, 0.9, 1.2, 1.5, 1.8
d 0.23, 0.25, 0.27, 0.29, 0.31, 0.33
e 1.25, 1.30, 1.35, 1.40, 1.45, 1.50
f 1.67, 1.70, 1.73, 1.76, 1.79, 1.82

4 a 1 + 0.5 = 1.5 = 2 = 2.5 = 3 = 3.5 = 4
b 1.5 + 0.1 = 1.6 = 1.7 = 1.8 = 1.9 = 2 = 2.1
c 2.3 + 0.2 = 2.5 = 2.7 = 2.9 = 3.1 = 3.3 = 3.5
d 1.8 + 0.3 = 2.1 = 2.4 = 2.7 = 3 = 3.3 = 3.6
e 2.3 + 0.6 = 2.9 = 3.5 = 4.1 = 4.7 = 5.3 = 5.9
f 2.6 + 0.8 = 3.4 = 4.2 = 5 = 5.8 = 6.6 = 7.4
g 2.6 + 2.2 = 4.8 = 7 = 9.2 = 11.4 = 13.6 = 15.8
h 3.9 + 0.3 = 4.2 = 4.5 = 4.8 = 5.1 = 5.4 = 5.7

5 a 4.2, 6.4, 8.6, 10.8
b 5.5, 10.5, 15.5, 20.5
c 0.6, 0.7, 0.8, 0.9
d 4.4, 4.3, 4.2, 4.1
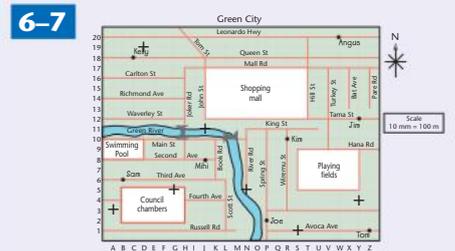
6–7
a Kelly   C 18   e Mihi   J 8
b Joe   P 2   f Angus   W 20
c Sam   B 6   g Jim   Y 12
d Kim   R 10   h Tom   Z 1

8 a Kelly's house to Kim's 1450 m
b Sam's house to Mihi's 600 m
c Kelly's house to Jim's 1400 m
d Joe's house to Mihi's 900 m

9 g Angus's house

10 a 20   b 12   c 16   d 28   e 8   f 0

11 a Burton High   c 45
b 40   d 50

12 Hands on. (• = 5 children is an appropriate scale. A dot plot using this scale is represented below.)

Prep   Year 1   Year 2   Year 3   Year 4   Year 5   Year 6

Answers

Unit 26

1
a 129.449 kg   **b** 45.677 L
c 93.296 m   **d** 57.939 km
e 79.409 ha   **f** 81 399 t
g 67.549 km   **h** 27.987 m
i 110 866 ha   **j** 42.658 g
k 541.424 m   **l** 1 248 464 kg
m 4480.11 t   **n** 488 531 cm
o 105 094.8 L

2 a

Mercedes	$366 999
BMW	$263 999
Difference	$103 000

b

Honda	$220 540
Lexus	$155 550
Difference	$64 990

c

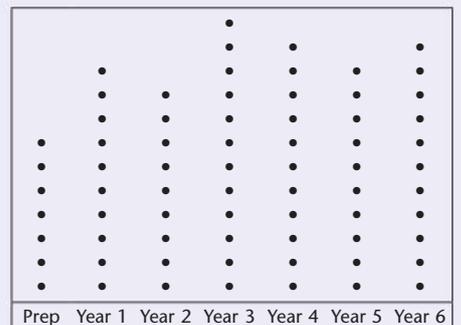| Porsche	$300 000
Jaguar	$216 399
Difference	$83 601

3

	Date	Beginning of trip	End of trip	Kilometres travelled
a	18/9	38 542	39 461	919
b	19/10	43 814	44 002	188
c	4/11	44 629	44 913	284
d	29/3	52 414	52 739	325
e			**Total**	1716

4
a $1909\frac{1}{3}$ **e** $4821\frac{1}{6}$ **i** $4495\frac{7}{8}$
b $7383\frac{3}{4}$ **f** $17005\frac{1}{5}$ **j** $5069\frac{7}{9}$
c 13 085   **g** $6154\frac{3}{6}$ **k** $2973\frac{8}{10}$
d $6490\frac{3}{4}$ **h** $12391\frac{5}{7}$

5 Possible solutions:
a ≈ 120 (1200 ÷ 10)
b ≈ 300 (1500 ÷ 10 = 150 then double)
c ≈ 1200 (12 000 ÷ 10)
d ≈ 20 000 (100 000 ÷ 5)
e ≈ 70 (350 ÷ 5)
f ≈ 60 (600 ÷ 10)
g ≈ 60 (600 ÷ 10)
h ≈ 34 (176.8 ÷ 10 = 17.68 then double)

6
a 7.12   **e** 86.5   **i** 300
b 5.17   **f** 14.71   **j** 563
c 10.52   **g** 72.125
d 9.7   **h** 26.25

7
a 53 km   **c** $205
b $65   **d** 45 runs

8
a Hands on.
b Triangular pyramid or tetrahedron.
c It has 4 vertices.
d It has 6 edges.
e It has 4 faces.
f All faces are equilateral triangles.

9 a

b This shape is called a square pyramid.
c It has 5 vertices.
d It has 8 edges.
e The base is a square.
f Four of its faces are congruent triangles.

10 Hands on—e.g. they are both pyramids.

11

	A	B	C
1	Date	Deposit	Subtotal
2	31 Jan	$319.50	(= C2) $319.50
3	28 Feb	$116.30	(= C2 + B3) 435.80
4	31 Mar	$121.40	(= C3 + B4) 557.20
5	30 Apr	$213.70	(= C4 + B5) 770.90
6	31 May	$118.05	(= C5 + B6) 888.95
7	30 June	$214.90	(= C6 + B7) 1103.85
8	31 July	$325.50	(= C7 + B8) 1429.35
9	31 Aug	$124.50	(= C8 + B9) 1553.85

12

	A	B	C	D
1	Date	Item	Cost	Balance
2	1 Aug	Opening	—	$3250.00
3	5 Aug	Registrations	$1350.00	(= D2 − C3) $1900.00
4	27 Aug	Mitts	$275.00	(= D3 − C4) $1625.00
5	1 Sep	Bags	$87.00	(= D4 − C5) $1538.00
6	5 Sep	Bats	$723.00	(= D5 − C6) $815.00
7	27 Sep	Balls	$257.00	(= D6 − C7) $558.00
8	28 Sep	Helmets	$250.00	(= D7 − C8) $308.00
9	11 Nov	Trophies	$178.00	(= D8 − C9) $130.00
10	12 Nov	Stamps	$40.00	(= D9 − C10) $90.00
11	15 Nov	Stationery	$55.50	(= D10 − C11) $34.50

Unit 27

1
a 6   **d** 70   **g** 1700
b 6.7   **e** 85   **h** 1820
c 3.67   **f** 27.4   **i** 1395

2
a 0.047   **d** 0.003 95   **g** 0.001 374
b 0.086   **e** 0.004 2   **h** 0.001 29
c 0.03   **f** 0.006   **i** 0.001 8

3

	Decimal	Multiply by	Whole number
a	0.3	× 10	3
b	0.7	× 10	7
c	0.35	× 100	35
d	0.654	× 1000	654
e	0.49	× 100	49
f	0.967	× 1000	967
g	0.76	× 100	76
h	0.5	× 10	5
i	0.06	× 100	6
j	0.007	× 1000	7

4
a 636 ÷ 600 = 1.06
b 64 ÷ 80 = 0.8
c 738 ÷ 600 = 1.23
d 729 ÷ 300 = 2.43
e 854 ÷ 700 = 1.22
f 917 ÷ 700 = 1.31
g 7446 ÷ 6000 = 1.241
h 3655 ÷ 5000 = 0.731
i 7884 ÷ 9000 = 0.876

5 Yes

6
a 21.3 m   **h** 25.3 kg   **o** $1.83
b 21.2 m   **i** 11.3 m   **p** $1.52
c 43.2 m   **j** 11.2 m   **q** 1.37 m
d 32.1 m   **k** 22.4 m   **r** 1.26 m
e 24.2 kg   **l** 22.4 m   **s** 1.53 m
f 36.4 kg   **m** $1.37   **t** 1.64 m
g 15.1 kg   **n** $1.92

7
a 8.23 m   **b** 6.92 m

8
a $3.32   **b** $21.14   **c** $19.31

9
a 30°   **d** 120°   **g** 130°
b 45°   **e** 70°   **h** 115°
c 60°   **f** 100°   **i** 55°

10
a 300°   **b** 260°   **c** 270°   **d** 330°

11
a ∠ABC = 70°   **b** ∠BCD = 80°
c ∠ABC = 120°   **d** ∠BAE = 110°
e ∠EAB = 70°

12 a

Hexagons	1	2	3	4	5	6
Sides	6	12	18	24	30	36

b
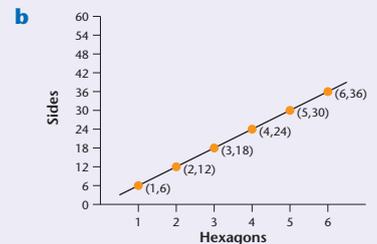
13 a

Octagons	1	2	3	4	5	6
Sides	8	16	24	32	40	48

b
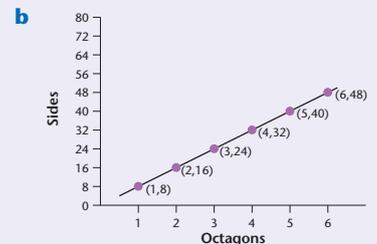
14 a

Decagons	1	2	3	4	5
Sides	10	20	30	40	50

b

c
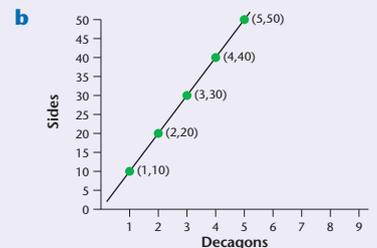
Dodecagons	1	2	3	4	5	6	7	8
Sides	12	24	36	48	60	72	84	96

d
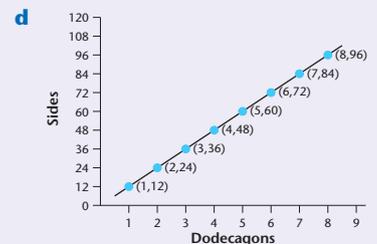
DIAGNOSTIC REVIEW 3

Part 1
a 22, 26, 30, 34, 38, 42, 46, 50, 54
b 3, 4, 5, 6, 7, 8, 9, 10, 11

Answers

Part 2

a 5.92
b 191.45
c 86.4
d 126.3
e 110.16
f 155.84
g 7776
h 23 760
i $9.53
j $31.20
k $66.23
l 1, 2, 4, 8, 16
m 1, 3, 7, 21

Part 3

a $\frac{1}{3} = \boxed{\frac{2}{6}} = \boxed{\frac{3}{9}} = \boxed{\frac{4}{12}} = \boxed{\frac{5}{15}}$

b $\frac{1}{5} = \boxed{\frac{2}{10}} = \boxed{\frac{3}{15}} = \boxed{\frac{4}{20}} = \boxed{\frac{5}{25}}$

c $\frac{2}{5} = \frac{4}{10}$ d $\frac{3}{4} \neq \frac{8}{10}$ e $\frac{3}{4} \neq \frac{4}{5}$ f $\frac{2}{8} \neq \frac{1}{5}$

Part 4

a $5
b $25
c $20
d $16
e $63
f 45 words
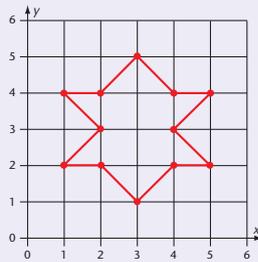
Part 5

Part 6

a scalene
b 40°
c 60°
d 80°
e equilateral
f 60°
g 60°
h 60°

Part 7

a F,5
b B,2
c B,5
d F,2
e 150 m
f 200 m
g 275 m

Part 8

No. One is a prism and the other is a pyramid.

Part 9

a 36 mm, 36 cm, 3 m, 3.6 m
b 45 mm, 4 cm, 45 cm, 4.5 m
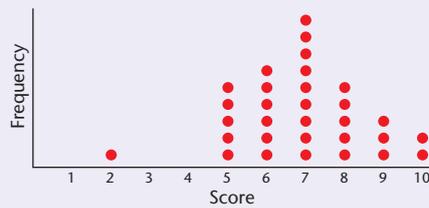c 0.5 m, 60 cm, 2.5 m, 502 cm

Part 10

Movie	Start	Duration	Finish
Special Day	1530	90 min	1700
Domino	1615	85 min	1740
Thai Tiger	1805	95 min	1940
The Red Car	1830	90 min	2000
Sunshine	1920	80 min	2040
The Secret	1930	80 min	2050

Part 11

135 cm³

Part 12
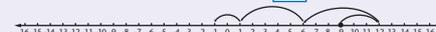
Unit 28
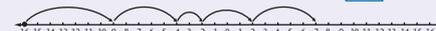
1 a $7 + 4 - 10 - 8 = \boxed{-7}$
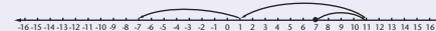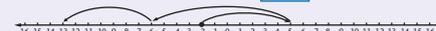
b $9 + 3 - 6 - 5 - 2 = \boxed{-1}$

c $-16 + 7 + 5 + 2 + 4 + 5 = \boxed{7}$

d $-2 + 7 - 11 - 7 = \boxed{-13}$

2
a −2
b −5
c −4
d −2
e −1
f +9
g −6
h +8
i −7
j +4
k −5
l −6
m +3
n −1
o −8

3 Hands on.

4
a 4.21 m
b 4.3 m
c 4.06 m
d 62.11 m
e $7.20
f $9.40
g 42.10
h $31.20
i 1.71 kg
j 43.41 kg
k 4.04 kg
l 36.86 kg

5
a $0.62
c $0.96
b $0.43
d 250 mL cartons

6
a $2\overline{)9.86}$ 4.93 ✓ e $6\overline{)26.46}$ 4.41 ✓ i $9\overline{)101.7}$ 11.3 ✓
b $3\overline{)8.46}$ 2.82 ✓ f $7\overline{)123.34}$ 16.62 ✗ j $4\overline{)99.92}$ 24.99 ✗
c $5\overline{)36.65}$ 7.33 ✓ g $8\overline{)99.92}$ 12.46 ✗ k $\boxed{70\%}$
d $4\overline{)53.28}$ 13.32 ✓ h $8\overline{)439.84}$ 54.98 ✓

7 a

Spelling Quiz		
Score	Tally	Frequency
1	|	1
2	|||	3
3	||||	4
4	||	2
5	ᚎ |||	8
6	ᚎ ||	7
7	ᚎ ᚎ	10
8	ᚎ ᚎ |||	13
9	ᚎ ||||	9
10	|||	3
Total		60

b

8 a 8 b 1 c 7 d 2 and 10 e 10

9 Hands on.

10 a

b a, b, d, e, f, g

11
a (−2,6)
b (6,6)
c (−3,4)
d (2,4)
e (5,3)
f (−4,2)
g (2,−2)
h (−5,−3)
i (−3,−3)
j (2,−4)
k (−2,−5)
l (5,−5)

Unit 29

1
a $12\frac{1}{3}$
b $72\frac{1}{5}$
c $123\frac{3}{6}$
d $158\frac{1}{4}$
e $92\frac{5}{7}$
f $371\frac{1}{6}$
g $513\frac{2}{7}$
h $890\frac{2}{3}$
i 336
j $127\frac{3}{8}$
k $458\frac{2}{6}$
l $132\frac{3}{8}$
m $547\frac{1}{3}$
n $445\frac{5}{6}$
o $417\frac{2}{4}$

2
a 31.25
b 220.25
c 110.125
d 37.1
e 334.3
f 456.7
g 269.9
h 818.333
i 247.4
j 323.375
k 1223.333
l 1225.333

3
a $4\overline{)13.^{1}0^{2}0}$ 3. 2 5
b $5\overline{)27}$ 5.4
c $4\overline{)337}$ 84.25
d $4\overline{)246}$ 61.5
e $5\overline{)357}$ 71.4
f $5\overline{)674}$ 134.8
g $8\overline{)521}$ 65.125
h $8\overline{)627}$ 78.375
i $6\overline{)39}$ 6.5
j $8\overline{)668}$ 83.5
k $6\overline{)651}$ 108.5
l $8\overline{)499}$ 62.375

4
a 12.25 m
b 94.167 mL
c $10 631.75

5
a 87
b 52
c 24
d 45
e 27
f 156
g 15
h 92
i 400
j 129

Answers

6 a 7 × 6 + 3 = 45
b 35 ÷ 5 × 4 = 28
c 7 × 9 + 17 = 80
d (6 + 7) × 4 = 52
e 16 × 2 − 2 = 30
f (37 + 3) × 3 = 120
g 10 × (2 + 9) = 110
h 75 ÷ 5 × 2 = 30
i (6 + 50) ÷ 8 = 7
j 63 − 6 ÷ 3 = 61

7 Hands on.

8 Adele (3 + 5) × 9 = $72. The brackets are correctly placed—the equation is correct.

9 a $\frac{1}{5}$ **b** $\frac{1}{5}$ **c** $\frac{2}{5}$ **d** $\frac{1}{5}$

10–11 Hands on.

12 a approx 30 **c** approx 20
b approx 40 **d** approx 10

13 a approx 150 **c** approx 100
b approx 200 **d** approx 50

14

	Facts to be considered	Subtotals
a	The land you plan to buy will cost at least $220 000.	$220 000
b	The house drawn on the plan would cost $79 000.	$79 000
c	Fences cost $20 per metre.	$660
d	Carpets cost $70 per square metre.	$3 780
e	Mosaic tiles cost $50 per square metre.	$600
f	Quarry tiles cost $40 per square metre.	$1 000
g	The home will have a pool costing $25 570.	$25 570
h	A single garage will cost $15 500.	$15 500
i	**Total cost**	$346 110

Unit 30

1 a 8468 **c** 32 700 **e** 67 978
b 9840 **d** 55 062

2 a 3000 **d** 2000 **g** 7500 **j** 10 000
b 20 000 **e** 5000 **h** 10 000
c 18 000 **f** 4200 **i** 20 000
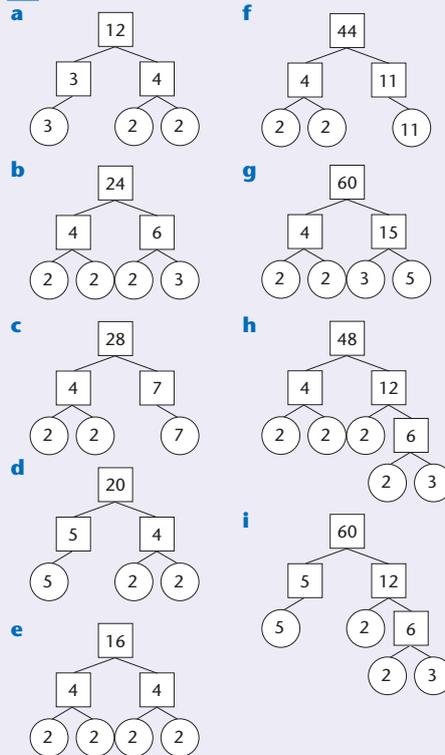
3 a 45 **b** 48 **c** 37 **d** 78 **e** 54

4 a 752 × 34 = 25 568 km
b 706 × 58 = 40 948 km
c 1167 × 27 = 31 509 km
d 2022 × 13 = 26 286 km
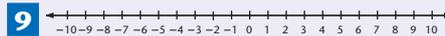
5 a composite **g** composite
b prime **h** composite
c prime **i** prime
d composite **j** composite
e composite **k** prime
f composite **l** composite

6 Hands on. (No, because a squared number by definition is divisible by numbers other than itself and one.)

7
a
b
c
d
e
f
g
h
i

8 a 3 × 2 × 2 = 12
b 2 × 2 × 2 × 3 = 24
c 2 × 2 × 7 = 28

9
$$-10\ -9\ -8\ -7\ -6\ -5\ -4\ -3\ -2\ -1\ 0\ 1\ 2\ 3\ 4\ 5\ 6\ 7\ 8\ 9\ 10$$

10 John finished on step −3.

11 a Bangkok 34°C
b Montreal −10°C
c Berlin 10°C to −5°C

12 a 7°C **c** 13°C **e** 8°C
b 11°C **d** 12°C **f** 10°C

13 a 23°C **b** 21°C **c** 12°C **d** 15°C

14
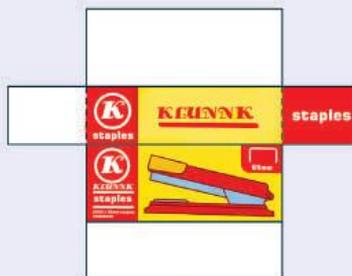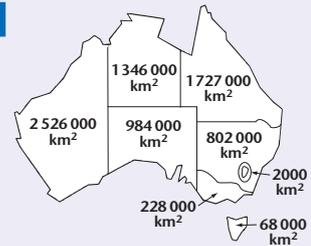
15 Hands on.

Unit 31

1 a 91.107 **e** 129.304 **i** 10 159.31
b 157.579 **f** 1182.41 **j** 11 894.55
c 16.503 **g** 1327.816 **k** 1558.75
d 1449.62 **h** 1 203.204 **l** 1984.132
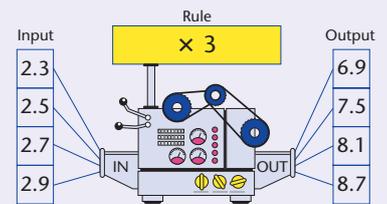
2
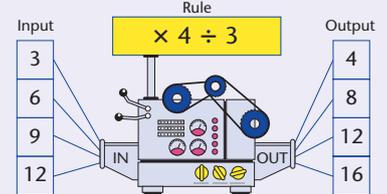
3 a True **b** True **c** False

4 a minus 2, 87 and 85
b multiply by 2, 16 and 32
c add $\frac{1}{2}$, $2\frac{3}{4}$ and $3\frac{1}{4}$
d minus 13, 35 and 22
e add 0.5, 20 and 20.5
f divide by 2, 8 and 4
g add 0.3, 5.2 and 5.5
h divide by 2, $\frac{1}{4}$ and $\frac{1}{8}$

5 a

Input	Rule × 3	Output
2.3		6.9
2.5		7.5
2.7		8.1
2.9		8.7

b

Input	Rule × 4 ÷ 3	Output
3		4
6		8
9		12
12		16

6 a Multiplication and addition

▲	1	2	3	4	5	6	7
●	3	5	7	9	11	13	15

Rule ▲ × 2 + 1 = ●

b Multiplication and subtraction

▲	1	2	3	4	5	6	7
●	3	9	15	21	27	33	39

Rule ▲ × 6 − 3 = ●

c Subtraction and division

▲	10	20	30	40	50	60	70
●	0	2	4	6	8	10	12

Rule (▲ − 10) ÷ 5 = ●

d Multiplication and subtraction

▲	1	2	3	4	5	6	7
●	3	11	19	27	35	43	51

Rule ▲ × 8 − 5 = ●

7 a Brown $\frac{5}{20}$ or $\frac{1}{4}$ **d** Fair $\frac{6}{20}$ or $\frac{3}{10}$
b Blond $\frac{3}{20}$ **e** Red $\frac{1}{20}$
c Black $\frac{5}{20}$ or $\frac{1}{4}$

8 Hands on.

9 **a** NSW and Vic.
b NT.
c Tas and ACT.
d Yes
e Between 3 and 4 million.

10 Hands on (suggested answers below).

	millilitres	litres	kilolitres	megalitres
liquid paper	✓			
laundry bucket		✓		
coffee mug	✓			
a dam				✓
backyard pool			✓	
large soft drink		✓		
rainwater tank			✓	

11 **a** 5 L   **c** 4 L   **e** 8 ML
b 9 kL   **d** 60 kL   **f** 2 ML

12 **a** 86 kL   **d** 60 ML   **g** 9.9 ML
b 4.5 L   **e** 5.5 ML   **h** 2000 L
c 950 kL   **f** 120 kL

13 **a** 150 kL   **c** 910 000 L
b 4000

Unit 32

1 **a** 15 610   **e** 43 491   **i** 28 566
b 15 946   **f** 8625   **j** 57 596
c 6615   **g** 12 075
d 23 751   **h** 12 190

2 **a** $7209   **c** $25 263   **e** $98 280
b $55 629   **d** $35 016

3

	Shop	Rent	Weeks	Estimate	Rent	✗ or ✓
a	Fruit	$398	19	$8000	$5562	✗
b	Baker	$307	39	$12 000	$11 973	✓
c	Cafe	$412	32	$12 000	$13 184	✓

4 **a** 4   **c** 4   **e** 90   **g** $\frac{1}{3}$
b 3   **d** 5   **f** 5   **h** 2

5 **a** 2 × 25   **e** 57 − 24   **i** 21 × 4
b 75 ÷ 3   **f** 30 − 6   **j** 17 + 30
c 150 − 25   **g** 90 − 9
d 25 × 7   **h** 100 − 77

6 **a** 4   **b** 6   **c** 8   **d** 4   **e** 6

7 **a** Hands on (True).   **c** Hands on (True).
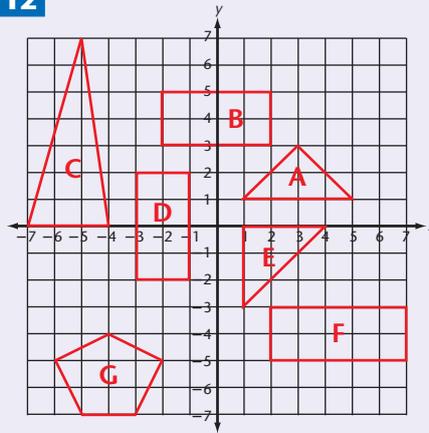**b** Hands on (True).

8 **a** $50
b Hands on (the graph only represents a small price range that would not accommodate all computers)
c Hands on (the word 'tumble' implies a more substantial drop in prices).

9 Hands on.

10 **a** Palm   **c** Treasure   **e** Skull
b Ghost   **d** Pirate

11 **a** (4,2)   **b** (−5,−3)   **c** (4,−4)

12

Unit 33

1 **a** 4.52   **c** 452   **e** 846
b 45.2   **d** 84.6   **f** 8460

2 **a** 231   **b** 2310   **c** 23 100
d The decimal moved one place to the right, making the value of each number 10 times greater.
e The decimal moved two places to the right, making the value of each number 100 times greater.
f The decimal moved 3 places to the right, making the value of each number 1000 times greater.

3 **a** 0.452   **c** 0.00452   **e** 0.0846
b 0.0452   **d** 0.846   **f** 0.00846

4 **a** 2.31   **b** 0.231   **c** 0.0231
d The decimal point moved one place to the left, making the value of each number 10 times smaller.
e The decimal point moved two places to the left, making the value of each number 100 times smaller.
f The decimal point moved three places to the left, making the value of each number 1000 times smaller.

5 **a** 3.74   **c** 87.4   **e** 3674
b 33.56   **d** 825.6   **f** 5296

6 Hands on.

7 **a** $1\frac{2}{10}$, $1\frac{5}{10}$, $1\frac{8}{10}$ **d** 2, $2\frac{2}{10}$, $2\frac{4}{10}$, $2\frac{6}{10}$
b $1\frac{8}{10}$, 2, $2\frac{2}{10}$ **e** $2\frac{2}{10}$, $2\frac{6}{10}$, 3
c $1\frac{6}{10}$, 2, $2\frac{4}{10}$ **f** $2\frac{3}{10}$, 2, $1\frac{7}{10}$

8 **a** 1.2, 1.5, 1.8   **d** 1.9, 2.1, 2.3
b 1.6, 2, 2.4   **e** 1, 0.5, 0
c 0.24, 0.3, 0.36   **f** 1.9, 1.5, 1.1

9 **a** 0.23, 0.26, 0.29   **f** $2\frac{3}{6}$, $2\frac{5}{6}$, $3\frac{1}{6}$
b 0.47 0.51, 0.55   **g** $4\frac{2}{3}$, $5\frac{1}{3}$, 6
c 0.23, 0.27, 0.31   **h** 6, $6\frac{3}{4}$, $7\frac{1}{2}$
d 6.57, 6.62, 6.67   **i** $5\frac{4}{8}$, $5\frac{7}{8}$, $6\frac{2}{8}$
e 0.27, 0.33, 0.39   **j** $6\frac{8}{12}$, $7\frac{1}{12}$, $7\frac{6}{12}$

10 **a** Hands on.   **d** No
b Column graph   **e** Pie chart
c Picture graph, dot plot

11–12 Hands on.

13 **a** Hands on.
b Hands on (It was too small).

14 **a** Hands on.
b Hands on. (No. Interviewing children in a hamburger restaurant is likely to yield biased results.)

Unit 34

1 **a** 2 pigs   **e** 4 pens   **i** 40 birds
b 10 dogs   **f** 5 goats   **j** 12
c 20 cats   **g** 16 biros   **k** $50
d $10   **h** $6   **l** $40

2

	Cost	Discount	Discounted cost
a	$20	$2	$18
b	$10	$2	$8
c	$48	$12	$36
d	$76	$38	$38
e	$6	$0.60	$5.40
f	$30	$6	$24
g	$2	$0.50	$1.50

3 **a** Splinter   **c** Zapper
b Razor   **d** Lazer

4

	Currency	Amt ÷ Exch. Rate	$A
a	NZ	$410 ÷ 1.21	$338.84
b	Canada	$1000 ÷ 0.88	$1136.36
c	USA	$1200 ÷ 0.87	$1379.31
d	France	$807 ÷ 0.56	$1441.07
e	Fiji	$285 ÷ 1.2	$237.50
f	Singapore	$910 ÷ 1.06	$858.49
g		Total	$5391.57

5 **a** $42.50   **b** $62.50

6–9
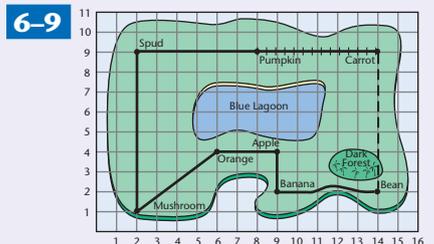
10 Hands on.

11 Suggested answers:

	Less than 1 m³	About 1 m³	More than 1 m³
Tent			✔
Classroom			✔
Milk crate	✔		
Toddler's pool	✔		
Cubbyhouse		✔ or	✔
Fruit box	✔		
Refrigerator		✔	
TV set	✔		
Chalk box	✔		
Barbecue		✔	

12 **a** 240 m³   **b** 10 000 m³   **c** 48 000 m³

13 8
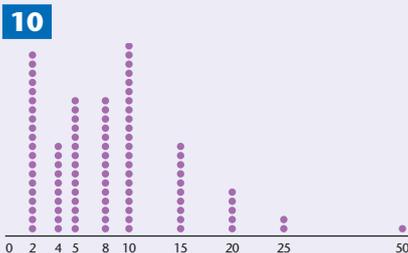
Answers

Unit 35

1
- **a** 0.5
- **b** 0.25
- **c** 0.125
- **d** 0.75
- **e** 0.375
- **f** 0.875
- **g** 0.625
- **h** 0.2
- **i** 0.6
- **j** 0.8
- **k** 0.625
- **l** 0.9

2
- **a** 0.6̇
- **b** 0.16̇
- **c** 0.83̇
- **d** 0.3̇
- **e** 0.1̇
- **f** 0.4̇
- **g** 0.583̇
- **h** 0.916̇

3
- **a** 15.6̇
- **b** 314.3̇
- **c** 42.6̇
- **d** 205.83̇
- **e** 596.16̇
- **f** 234.16̇
- **g** 357.16̇
- **h** 216.1̇
- **i** 235.1̇
- **j** 243.8̇
- **k** 377.1̇
- **l** 357.83̇

4
- **a** A
- **b** B
- **c** C

5
- **a** 22
- **b** 85
- **c** 10
- **d** 3
- **e** 10.5
- **f** 63
- **g** 15

6
- **a** 4
- **b** 4
- **c** 9
- **d** 21
- **e** 12
- **f** 18

7
- **a** 10 × 35c + 2 × $1.80
- **b** 3 × $7.80 + 2 × $2.50 + 2 × $1.80 + 10 × 35c

8
- **a** 25 × $0.22 + 3 × $1.10 + 9 × $0.50 = $13.30
- **b** 15 × $0.50 + 8 × $1.10 + 30 × $0.22c = $22.90
- **c** 22 × $1.10 + 39 × $0.05 + $0.50 = $26.65

9

Amount	Tally	Frequency
$2	𝍩𝍩𝍩𝍩	20
$4	𝍩𝍩	10
$5	𝍩𝍩𝍩	15
$8	𝍩𝍩𝍩	15
$10	𝍩𝍩𝍩𝍩		21
$15	𝍩𝍩	10
$20	𝍩	5
$25	||	2
$50			1

10
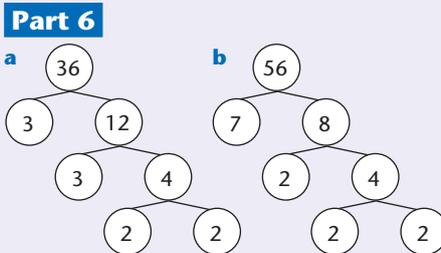
11
- **a** $10
- **b** $8

12
- **a–c** Hands on.
- **d** 1 kg

13
- **a–c** Hands on.
- **d** 50 g, 100 g, 250 g, 500 g 1 mL has a mass of 1 gram.

14 Hands on.

DIAGNOSTIC REVIEW 4

Part 1
- **a** $825
- **b** 2250 cm
- **c** 915 km

Part 2
- **a** 20
- **b** 40
- **c** 20
- **d** 50
- **e** 50
- **f** 20

Part 3
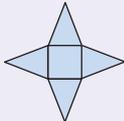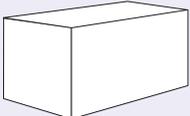- **a** $160 − $40 = $120
- **b** $200 − $100 = $100
- **c** $120 − $12 = $108

Part 4
1.44, 1.48, 1.52

Part 5

a	0.528	5.28	52.8	528
b	2.259	22.59	225.9	2259
c	0.456	4.56	45.6	456
d	6.707	67.07	670.7	6707
e	958.00	95.8	9.58	0.958
f	675.25	67.525	6.7525	0.67525
g	999.99	99.999	9.9999	0.99999
h	676.75	67.675	6.7675	0.67675

- **i** 42.5 m
- **j** $200

Part 6

Part 7
- **a** 50
- **b** 49
- **c** 78
- **d** 71
- **e** 56
- **f** 60
- **g** 15
- **h** 98

Part 8
- **a** (−4, −2)
- **b** (−1, 1)
- **c** (3, 4)
- **d** (6, 1)
- **e** (2, −2)

Part 9

- **a** 5 faces 5 vertices 8 edges Square pyramid
- **b** Rectangular prism

Part 10
- **a** 7 L
- **b** 40 kL
- **c** 3.5 L
- **d** 75.4 L
- **e** 3 ML
- **f** 50 ML

Part 11
- **a** 800
- **b** 400
- **c** 200
- **d** 100

Part 12
600 m³

Part 13
a

Score	Tally	Frequency
1						4
2	𝍩	5
3				2
4	𝍩	5
5					3
6			1

- **b** No.
- **c** Hands on. (The current tally of sixes thrown doesn't affect its future chances of being thrown.)

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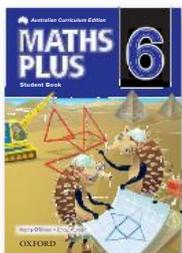### Interactive Teaching CD-ROM
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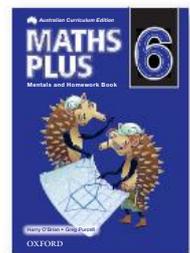➤ Suitable for all computers and interactive whiteboards

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