Australian

Signpost MATHS

6

Mentals

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Using the Mentals Books

Each unit of a Mentals Book is programed to review Student Book content from the previous two weeks (based on the Suggested Program in the Teacher's Book). For example, Unit 15 of the Mentals Book can be set as homework to review weeks 13 and 14 of the Student Book while week 15 is being taught.

Presentation

- The content of the strands Number and Algebra, Measurement and Geometry, and Statistics and Probability is covered thoroughly.
- Essential skills are explained.
- Language, problem solving, graphs and tables are given a high profile.
- Mathematics is applied to real-life situations wherever possible.
- The **Arithmetic Card** (page 5) is an exciting teaching tool for practising basic number skills.
- **ID Cards** (pages 6–9) review the terms essential to success in the course.
- **Measurement examples and standards** (page 84 and inside back cover) are provided so that students can estimate effectively.

Mixed-topic Questions

The units present questions in a mixed-topic format.

- This is essential for thorough understanding and continuous review.
- In real life, similar questions don't often occur together.
- It allows the teacher to discover weaknesses that could otherwise pass unnoticed.
- It provides a real test of understanding.

Graded Questions

- Column 1: easier
- Columns 2 and 3: harder
- Column 4: Extension and Challenge

Motivation

- Cartoons make mathematics more appealing.
- There are two lizards hidden on each page for students to find.

Extra Activities

Strategy Time

- Problem-solving **strategies** are introduced in a carefully planned sequence throughout the series.

Concept

Important concepts from **Number and Algebra** and **Measurement and Geometry** are explored.

Measure

- **Measurement** concepts and activities are introduced and investigated.

Chance

- **Statistics and Probability** concepts (Data and Chance) are presented for revision and extension.

+ Tables   **– Tables**   **× Tables**   **÷ Tables**

- A **tables** program for each of the four operations is included.
- It is important for students to try to learn addition and multiplication tables by heart.

(6) Contents

Teaching Ideas Using Headers

| Unit	Content	Extra Activity	Unit	Content	Extra Activity
1:1/2 **1:3/4**	+ 3, + 5 Personal measures	+ Tables Measure	**20:1/2** **20:3/4**	÷ 9, ÷ 9 Profit and loss	÷ Tables Concept
2:1/2 **2:3/4**	− 2, − 4 Language	− Tables ID Card D	**21:1/2** **21:3/4**	Problem solving Height	Strategy Time Concept
3:1/2 **3:3/4**	× 10, × 5 Rounding (nearest 5c)	× Tables Concept	**22:1/2** **22:3/4**	Language Problem solving	ID Card C Strategy Time
4:1/2 **4:3/4**	× 2, × 4 Square numbers	× Tables Concept	**23:1/2** **23:3/4**	÷ 7, ÷ 8 Crossnumber puzzle	÷ Tables Concept
5:1/2 **5:3/4**	+ 4, + 6 Travel graph	+ Tables Concept	**24:1/2** **24:3/4**	÷ 4 Problem solving	÷ Tables Strategy Time
6:1/2 **6:3/4**	− 3, − 7 Order of operations	− Tables Concept	**25:1/2** **25:3/4**	÷ 6 Fractions	÷ Tables Concept
7:1/2 **7:3/4**	Order of operations Language	Concept ID Card B	**26:1/2** **26:3/4**	Mass Tally	Measure Chance
8:1/2 **8:3/4**	Percentages Equivalent fractions	Concept Concept	**27:1/2** **27:3/4**	Language Fractions	ID Card A Concept
9:1/2 **9:3/4**	Multiplication Distance	× Tables Measure	**28:1/2** **28:3/4**	÷ 8 Fractions to decimals	÷ Tables Concept
10:1/2 **10:3/4**	× 3, × 6 Problem solving	× Tables Strategy Time	**29:1/2** **29:3/4**	÷ 7 Problem solving	÷ Tables Strategy Time
11:1/2 **11:3/4**	÷ 5, ÷ 10 Problem solving	÷ Tables Strategy Time	**30:1/2** **30:3/4**	× 8, × 6 Codes	× Tables Concept
12:1/2 **12:3/4**	Language Averages	ID Card A Concept	**31:1/2** **31:3/4**	+ 8 Estimate the product	+ Tables Concept
13:1/2 **13:3/4**	Averages Probability	Concept Chance	**32:1/2** **32:3/4**	Language Estimating chance	ID Card D Chance
14:1/2 **14:3/4**	÷ 2, ÷ 4 24-hour time	÷ Tables Measure	**33:1/2** **33:3/4**	Divisibility Square numbers	Concept Concept
15:1/2 **15:3/4**	÷ 3, ÷ 6 Problem solving	÷ Tables Strategy Time	**34:1/2** **34:3/4**	Factors Problem solving	Concept Strategy Time
16:1/2 **16:3/4**	− 9, − 5 Problem solving	− Tables Strategy Time	**35:1/2** **35:3/4**	Crossnumber puzzle Reflections	Concept Concept
17:1/2 **17:3/4**	+ 7, + 9 Language	+ Tables ID Card B	**36:1/2** **36:3/4**	− 6, − 8 Average speed	− Tables Measure
18:1/2 **18:3/4**	× 6, × 9 Survey	Concept × Tables	**37: 1/2** **37: 3/4**	Language Personal measures	ID Card C Measure
19:1/2 **19:3/4**	× 7, × 8 Length	× Tables Measure	**Answers**	These can be found in the middle of this book on pages A1 to A12.	

1 20 − 8 ____

2 4 × 7 ____

3 16 ÷ 4 ____

4 16 + 16 ____

5
```
  1 2
+   9
-----
```

6 Double 9. ____

7 80 minus 2. ____

8 96 plus 4. ____

9 Half of 54. ____

10
```
  1 2
×   4
-----
```

11 100 000 + 7 000 + 300 + 8 _____

12 Which Australian coins are silver?

_____

13 Complete the labels.

a

after

b

to
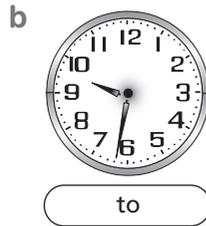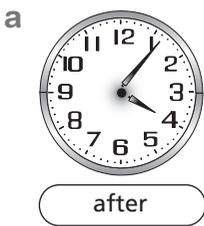
14 Four places before 53rd. _____

15 What is the value of the 6 in 2 160? _____

16 **a** What size is angle **A**?

_____

b What size is angle **B**?

_____
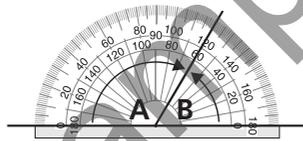
17 The number for each tally.

a ⅢⅢ ⅢⅢ ⅢⅢ ⅢⅢ ⅢⅢ ⅢⅢ ||| _____

b ⅢⅢ ⅢⅢ ⅢⅢ ⅢⅢ ⅢⅢ ⅢⅢ ⅢⅢ | _____

18 To square a number, multiply it by i_____.

1 4 × 8 ____

2 32 − 8 ____

3 7 × 7 ____

4 50 + 40 ____

5
```
  3 8
+ 8 1
-----
```

6 18 + 6 × 10 ____

7 50 × 6 ____

8 4 × ☐ = 28, ☐ = ____

9 28 ÷ 7 = ☐, ☐ = ____

10
```
  $6 . 7 2
+ $9 . 1 6
---------
```

11 20 − 2 × 5 _____

12 Write as kilometres:

a 6 500 metres _____ **b** 900 metres _____

13
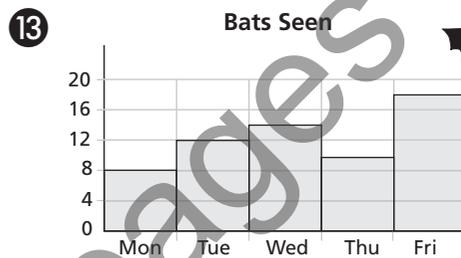
Bats Seen

a How many more bats were seen on Friday than Monday? _____

b On which two days were the least number of bats seen? _____

14 Millimetres in 14 cm 6 mm. _____

15 ▬▬▬▬▬▬

What is the length of this line to the nearest millimetre? _____

16 Two more than 7 squared. _____

17 Arrange in descending order: 31 673 316, 37 631 713, 33 761 301, 31 763 116.

_____

_____

Tables


```
      12   8   7
   4            3
        − 3
  10           11
      6    9   5
```



```
      8   14  13
  12           9
        − 7
  16           17
     10   15  11
```

even − odd = ____
odd − odd = ____

❶
Tens	Ones
4	0
− 3	7

❷
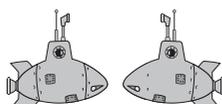| Tens	Ones
5	6
− 1	9

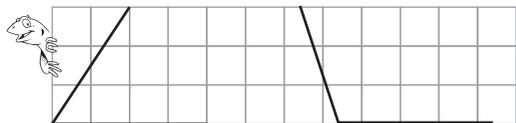❸ Write the value of 8 in:

a 7 380 213 _____

b 9 041 805 _____

❹ Write 7th in words. _____

❺ Is this a reflection, translation or rotation? _____

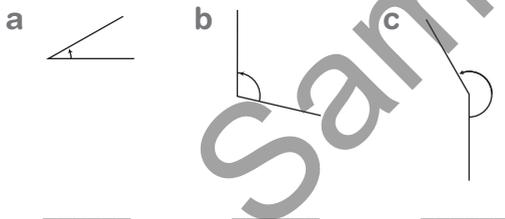❻ 18 shoes are in the shop window. How many pairs are there? _____

❼ a Complete the parallelograms.

b Are opposite sides of a parallelogram equal? _____

❽ Find the difference between 14 and 76. _____

❾ Estimate the size of these angles.

a b c

_____

❿ How many kilometres in 5 000 m? _____

⓫ The next two square numbers after 30. _____

❶ The shortest distance by road from:

a **A** to **F** _____   b **C** to **D** _____

A — 145 km — B
89 km →   ← 85 km
C
154 km   160 km
D
89 km →   ← 85 km
E — 139 km — F
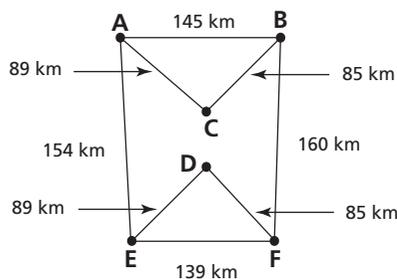
❷ I am paid between \$12 and \$14 an hour. Which could be my pay for 6 hours work: \$70.50, \$72.00, \$83.10 or \$84.00? _____

❸ Minutes in 9 hours. _____

❹ $\square \div 2 = 55$, $\square =$ _____

❺ The shaded part has value 30. What is the value of the whole? _____
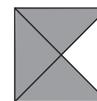
❻ If 3 small squares make a *trio* and 3 *trios* make a *nino*, could 57 small square make:

a one *trio* and 6 *ninos*? _____

b 7 *trios* and 4 *ninos*? _____

Challenge

Write number sentences with the answer 14, e.g. $4 + 5 \times 2 - (4 \times 0) = 14$

_____

_____

_____

Order of Operations

Example

Concept

$28 - (7 - 3) \div 2$

Remove the ( ).

$= 28 - 4 \div 2$

Do × and ÷.

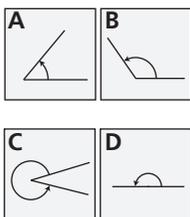$= 28 - 2$

$= 26$

Order
1 ( )
2 × and ÷
3 + and −
(going from left to right)

a $6 + 3 \times 5$ ___

b $10 - 2 \times 4$ ___

c $7 - (10 - 3)$ ___

d $28 - (20 - 10)$ ___

e $10 - 3 + 4$ ___

f $10 - (3 + 4)$ ___

g $20 - 4 + 9$ ___

h $25 - 19 + 1$ ___

i $20 \div 5 \times 12$ ___

j $20 \div (5 \times 2)$ ___

k $10 + (6 \div 2) \times 3 + 15 \div 3$ ___

Sample pages

1 6 − 6 ____
2 64 + 8 ____
3 21 ÷ 3 ____
4 9 × 100 ____
5
```
  3 8
+   4
____
```

6 1 squared. ____
7 8 groups of 4. ____
8 5 more than 33. ____
9 71 take away 4. ____
10
```
  4 2
−   3
____
```

11 Which angle is:
  a reflex? _____
  b straight? _____
  c acute? _____
  d obtuse? _____

12 Subtract 8 from 12. _____

13 6 000 + 400 + 7 _____

14 Use < or > in:
  a 82 095 ____ 82 210   **b** 30 979 ____ 30 997

15 Round off 6 389 correct to the nearest hundred. _____

16 62, 64, 66, ____, ____, ____

17 In this space draw a shape that will tessellate.
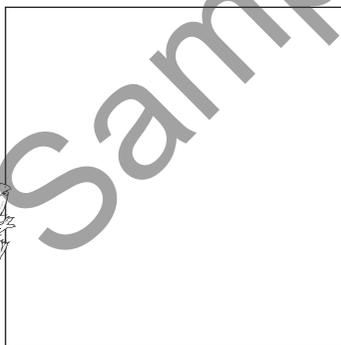
18 6 squared. _____

1 61 + 8 ____
2 4 × 9 ____
3 15 + 6 ____
4 5 × 60 ____
5
```
  2 1
×  1 0
_____
```

6 90 ÷ 10 ____
7 20 × 4 ____
8 4 × □ = 36, □ = ____
9 80 ÷ □ = 8, □ = ____
10
```
  3 7 8
+   4 6
_____
```

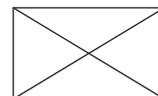**11** Round off the answer to Question 10, correct to the nearest 100. _____

12 (6 × 5) + 7 = _____
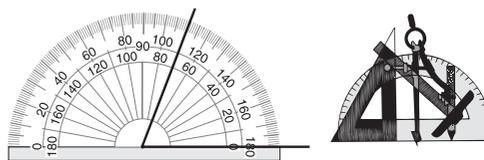
13 Name this solid. _____
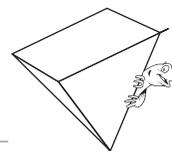
14 **a** Are opposite sides of a rectangle equal? _____
  b Do the diagonals cut each other in half? _____

15 Round off 1 742 to the nearest hundred. _____

16

  a The size of the angle shown? _____
  b Is this angle acute or obtuse? _____

17 4 squared. _____

18 **a**
```
  1 3 4
×     5
_____
```
  b
```
  2 1 8
×     4
_____
```

Order of Operations
❶ ( ) **❷ × and ÷** **❸ + and −**

Example
4 × (11 − 9) + 20 ÷ 2
Remove the ( ).
= 4 × 2 + 20 ÷ 2
Do × and ÷, (left to right).
= 8 + 10
= 18

a 11 − (8 − 3) _____
c 8 + 2 × 4 _____
e 20 − 12 ÷ 4 _____
g 6 ÷ 3 × 2 _____
i 11 − 4 + 5 _____
k 63 + 12 ÷ 6 − (8 + 12) ÷ (9 − 4 + 5) _____

b 14 − (20 − 10) _____
d 16 − 2 × 6 _____
f 15 + 6 ÷ 3 _____
h 20 ÷ 5 × 4 _____
j 21 − 11 + 6 _____

1 $\begin{array}{r} 2793 \\ -\ 242 \\ \hline \end{array}$ **2** $\begin{array}{r} 8790 \\ -\ 357 \\ \hline \end{array}$ **3** $\begin{array}{r} 300 \\ -\ 52 \\ \hline \end{array}$

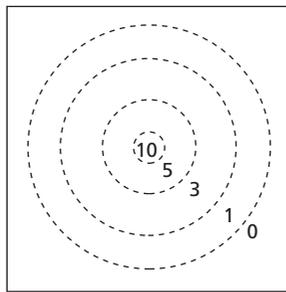**4** $\begin{array}{r} 20 \\ \times\ 4 \\ \hline \end{array}$ **5** $\begin{array}{r} 700 \\ \times\ 3 \\ \hline \end{array}$ **6** $\begin{array}{r} 9000 \\ \times\ 4 \\ \hline \end{array}$

7 How many are left over if 22 toys are shared by:

  a 3 girls? _____ **b** 4 girls? _____

8 How many minutes in 8 hours? _____

9 Two darts are thrown into this dartboard. Which totals (below 16) are impossible to obtain?

10 5 3 1 0

_____

10 A book has 82 pages. How many times was the digit 8 used in numbering its pages? _____

11 Use your ruler and protractor to find:

  a the number of equal sides _____

  b the number of equal angles _____

12 1, 15, 23, 49, 60
Which of these numbers are:

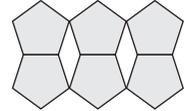 **a** multiples of 5? _____

  b square numbers? _____

1 $(5 \times 37) + (5 \times 37) =$ _____

2 Which number below is a multiple of 5, 6 and 7? _____
1764 1470 1120 1560

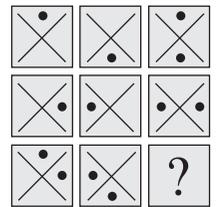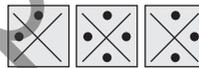**3** How many octagons of any shape are present? _____

4 **a** A whale weighs 140 000 kg. How many tonnes is this? _____

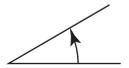 **b** A car had a mass of 1·8 t. How many kg is this? _____
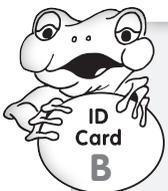
5 374 + 279 _____

6 Which is larger, $2^2 + 3^2 + 4^2$ or $1^2 + 5^2$? _____

7 Circle the square below that completes the pattern.

Challenge

Describe this angle. List places you might see an angle this size.

_____
_____
_____
_____
_____

Turn to ID Card B on page 7.

Give the answers for these numbers.

(7) _____ line (8) _____ lines

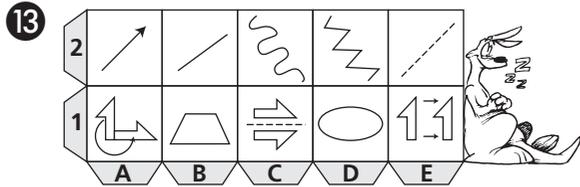(10) _____ line (11) _____ line

(14) _____ angle (15) _____ angle

(16) _____ angle (17) _____ angle

(18) _____ angle (19) _____
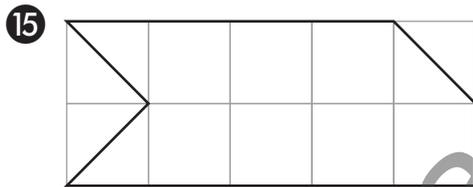
How many revolutions have I made?

1 5 × 6 ____   **6** 2 squared. ____

2 10 − 4 ____   **7** Add 6 and 17. ____

3 9 × 6 ____   **8** 4 rows of 9. ____

4 70 + 18 ____   **9** Take 40 from 95. ____

5 3)̄1 2   **10** 10)̄7 0

11 0·5 + 0·5 _____

12 Name a shape with 6 sides. _____

13

2	↗	/	∿	⩙	⁄
1	↰	⏢	⇉	⬭	1·1
	A	**B**	**C**	**D**	**E**

Give the name of the figure at:

a **E2** _____   b **B1** _____

c **C1** _____   d **D1** _____

e **E1** _____   f **A1** _____

g **D2** _____   h **B2** _____

14 A shape with five straight sides is called a _____.

15

What is the area of this shape in square centimetres? _____ cm²

16 The difference between 14:30 and:

a 08:30 on the same day. _____

b 08:30 on the next day. _____

1 9 × 3 ____   **6** 0·7 + 0·3 ____

2 32 − 3 ____   **7** □ × 10 = 100, □ = ____

3 6 × 7 ____   **8** 0·1 + 0·9 ____

4 8 + 41 ____   **9** 180 − 2 × 70 ____

5 4)̄3 6   **10** 5)̄3 6 ʳ

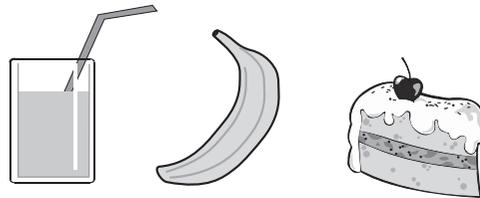**11** a 4 × 8 + 10 _____

   b 16 ÷ 4 + 20 ÷ 5 _____

12 At a speed of 60 km/h, how far would I travel in 2 hours? _____

13 What is the area of a rectangular dance floor that has a length of 12 m and a width of 6 m? _____

14 How many sides does an octagon have? _____

15 0·8, 1·0, 1·2, _____, _____

16 Minutes in 4½ hours. _____

17 Heidi began with $30 and bought these items.

$2.80 $1.70 $1.40

Total spent = _____

Amount left = _____

+ Tables

* ↑ + 7

9	5	2
1		6
7		4
3	10	8

* ↑ + 9

9	5	2
1		6
7		4
3	10	8

even + odd = ____

odd + even = ____

1
```
  8 3 9 2 1
  3 5 0 3 2
+   2 1 1 5
```

2
```
  7 3 0 · 9 3
  1 4 3 · 7 1
+   2 1 · 3 0
```

3 The 24-hour time, one hour after:

a 12:30 am _____ **b** 12:30 pm _____

4 a What is the main ingredient used in making a quiche?

_____

Quiche Recipe by Weight

herbs & spices, eggs, pastry, bacon, cream, onion, cheese

b What fraction of the final quiche is made from eggs?

_____

c If the quiche weighs 400 g, how many 50 g eggs were used in the recipe? _____

Which would we use more of:

d bacon or cheese? _____

e pastry or onion? _____

5 Sides on a pentagon. _____

6 Write $3\frac{4}{5}$ as an improper fraction. _____

7 Opposite sides of a rectangle

are e _____ and p _____ .

8 How long will it take to travel 900 km at an average speed of 90 km/h? _____

9 a $15 - (9 - 6)$ _____

b $100 \times 2 - 10 \times 2$ _____

1 Cara begins with $95.50. She buys:

Milk and bread $4.45
Fruit and vegetables $12.50
Sandwich and soft drink $4.75
Petrol $20.00
Piano lessons $20.00

a What is Cara's total cost? _____

b How much money is left? _____

2 **How $50 was spent**

Clothing	Food	Fares

Divided bar graph

a What % was spent on fares? _____

b What % was spent on food? _____

3
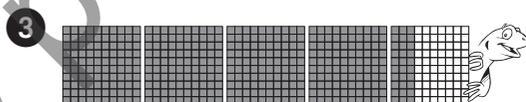
Write this number as a:

a mixed number _____

b decimal _____

Challenge

Write decimal addition sentences that are equal to 1, e.g. $0·75 + 0·25$.

_____

_____

Turn to ID Card B on page 7.

Give the answers for these numbers.

(9) _____ lines (13) _____ of an angle

(20) _____ (21) _____

(22) _____ (23) _____

(24) _____ (26) _____ of symmetry

(28) _____ (29) 1: _____

Flip, slide or turn?

1 6×5 ____

2 $9 + 7$ ____

3 $11 - 5$ ____

4 $12 \div 6$ ____

5 $2\overline{)4\,0\,0}$

6 5 squared. ____

7 80 minus 9. ____

8 8 more than 88. ____

9 Divide 60 by 6. ____

10 $3\overline{)6\,0}$

11 Complete the pattern.
0·36, 0·37, 0·38, _____, _____

12 Arrange in descending order
75 124 911, 75 241 119, 75 921 977
_____

13 If I had \$35, how many of these books could I buy?
_____
\$7.50

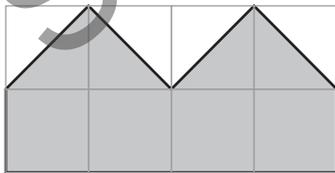**14** What is the value of the 7 in 3 411 723? _____

15 What is the difference between walking straight to school (9 072 paces) or going via the shops (10 180 paces)? _____

16 Is 2 132 a multiple of 3, 4 or 5? _____

17 **a** How many halves in $2\frac{1}{2}$? _____

b How many quarters in 3? _____

18 What is the area of the shaded shape?
_____ cm²

1 9×8 ____

2 $48 - 6$ ____

3 8×8 ____

4 $12 + 64$ ____

5 $6\overline{)2\,0}^{\,r}$

6 $36 \div 6$ ____

7 $6 + 3 \div 3$ ____

8 $\square + 81 = 99$, $\square =$ ____

9 $180 - \square = 5$, $\square =$ ____

10 $3\overline{)1\,7}^{\,r}$

11 From **A**, what is:
a north-east? _____
b south-west? _____

12
Travelling to School
☐ = Males
▨ = Females
276
122
41
7
Walked   Cycled
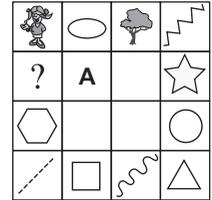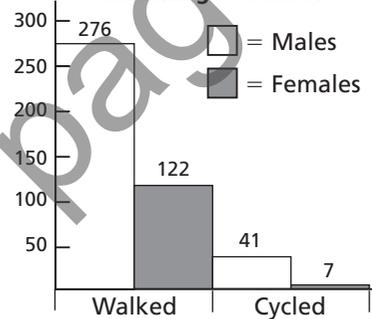
a How many people who walked were females? _____

b Is it more likely that the next person to arrive at school by walking will be male or female? _____

c How many people walked altogether? _____

13 $0.6 + 0.4$ _____

× Tables

7 3 8
2 × 6 10
0   6
5 9 4

7 3 8
2 × 9 10
1   6
5 9 4

The digits in each number add up to 9.

9 18 27 36 45
54 63 72 81 90

Sample pages

1
$$3 \cdot 5\ 1\ 2$$
$$+\ 2 \cdot 3\ 4\ 8$$

2
$$6 \cdot 9\ 9\ 9 \text{ km}$$
$$+\ 3 \cdot 2\ 1\ 4 \text{ km}$$

3 Which island is at:

a **D2**?

_____

b **B4**?

_____

Which island is:

c north of the ship?

_____

d south-east of the ship?

_____
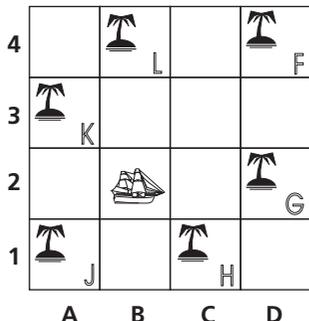
4 Complete each pattern.

a 0·2, 0·8, 1·4, _____, _____

b 0·3, 0·6, 0·9, _____, _____

5 A stone is kicked 5·8 m then 7·8 m and finally 12·1 m. How far has it been kicked altogether? _____
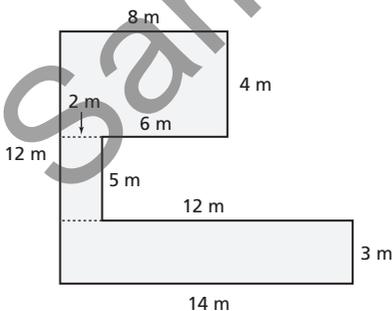
6 Write as an improper fraction:

a $2\frac{1}{4}$ _____

b $3\frac{3}{5}$ _____

7 For this shape find the:

a perimeter
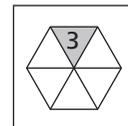
_____

b area

_____

8 m
4 m
2 m
6 m
12 m
5 m
12 m
3 m
14 m

1 The Foster family used 5 tins of paint for walls upstairs, and 3 tins of paint in the study downstairs. 1 tin of paint covers 100 m². What area was covered?

_____

2 One sixth of a whole is 3. Write the value of each shaded part.

a _____   **b** _____

3

3
A   B   C   D
6   8

Give the value at the letter:

a A _____   **b** B _____

c C _____   **d** D _____

4 Which factors of 64 are also multiples of 8? _____

5 The numeral for:

a CCXCIX _____   **b** CLXXXIV _____

Challenge

Ask 5 people to tell you their favourite hobby. Record the results below. Do you think this is an accurate reflection of your whole suburb? Why or why not?

_____

_____

_____

Concept
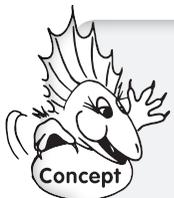
Conduct a survey to find out which sport is the most popular.

a How many people will you ask? _____

b Who will you ask? _____

_____

c How will you collect the information? _____

_____

_____