Mathletics

Series G Teacher

# Length, Perimeter and Area

# Series G – Length, Perimeter and Area

## Contents




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# Series G – Length, Perimeter and Area

### Pages 1–2

**1** eg. 100 cm = 1 m
10 m = 0.001 km, etc.

**2a** mm
**b** km
**c** m
**d** mm
**e** m
**f** mm
**g** km
**h** cm

**3** Nose: mm or cm
Height: cm or m

**4** Teacher check.

**5** Answers will vary.

**6** Observe students.

### Pages 3–4

**1a** 14, 1.4
**b** 28, 2.8
**c** 42, 4.2
**d** 69, 6.9

**2a** 20
**b** 40.5
**c** 823.8
**d** 200
**e** 1,900
**f** 45,000

**3a** 4
**b** 0.28
**c** 3.25
**d** 4.82
**e** 1.23
**f** 7.777
**g** 4.341
**h** 1.87
**i** 0.198

**4a** 120 mm, 13 cm, 3 m
**b** 5 m, 540 cm, 5,700 mm
**4c** 325 mm, 300 cm, 3.25 m

**5** metres: 52.67; 0.003
centimetres: 9.5, 751.3; 0.3; 12.7
millimetres: 2,570; 52,670; 127

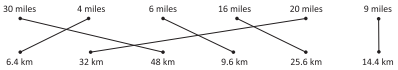
**6** Teacher check.

**7** Teacher check.

### Page 5

**1a** 6.6
**b** 7.5
**c** 9.1
**d** 2
**e** 2.4
**f** 91.5
**g** 0.8
**h** 3.2

**2**




**3a** 1.65
**b** the European snail

### Pages 6–7

**1a** $\frac{1}{2}$
**b** $\frac{3}{4}$
**c** $\frac{1}{10}$
**d** $\frac{1}{4}$

**2** Teacher check.

**3a** 1
**b** 2
**c** centimetres
**d** metres
**e** 8.6

**4** Answers will be approximates.
**a** 8 m
**b** 90 cm
**c** 5 m
**d** 1 m

**5** Teacher check.

### Page 8

**What to do**
Teacher check.

**What to do next**
Observe students.

### Pages 9–10

**1** Teacher check.

**2a** 12
**b** 14
**c** 8
**d** 19
**e** 15
**f** 24

**3a** 10 m
**b** 10 m
**c** 9 m
**d** 9 m

**4** 16.4 cm;
33 mm;
18.2 m;
5.6 m

**5a** 40 cm
**b** 52 mm
**c** 22.4 cm
**d** 37.2 cm
**e** 6.6 cm

### Pages 11–13

**1a** 30 m
**b** 30 m
**c** 26.8 m

**2a** 32 m
**b** 13 m
**c** 23 km

**3** Teacher check.

# Series G – Length, Perimeter and Area

**Pages 11–13**

**4a** 300 mm

**b** 41.6 m

**c** 160 mm

**5a** 30 mm

**b** 6 m

**c** 21.6 cm

**6a** 24 cm

**b** 33.72 mm

**c** 16.8 cm

**7** Teacher check.

**8** Teacher check.

**Page 14**

**a** 4 m

**b** 5.3 mm

**c** 48 m; 24 m

**d** 48 m

**Pages 15–16**

**1a** 4

**b** 4

**c** 2

**d** 5

**e** 7

**f** 6

**2** Teacher check.

**3a** Teacher check.

**b** Answers will vary.

**4a** 1

**b** 8

**c** 3

**d** 2

**e** 5

**f** 11

**g** 40,000

**h** 90,000

**i** 120,000

**j** 0.5

**k** 1.5

**l** 0.75

**5a** $cm^2$

**b** $km^2$

**c** ha

**d** $cm^2$

**e** ha

**f** $km^2$

**g** $cm^2$

**h** $m^2$

**Pages 17–18**

**1a** 6 $m^2$

**b** 4 $cm^2$

**c** 9 $m^2$

**2a** 40 $cm^2$

**b** 210 $cm^2$

**c** 250 $m^2$

**d** 45 $cm^2$

**e** 420 $cm^2$

**f** 1,500 $m^2$

**g** 100 $m^2$

**h** 34.68 $m^2$

**3a** £600

**b** 220 $cm^2$

**c** 5 m

**3d** Answers will vary.
Two possible answers:
Option 1 6 cm; 8 cm
Option 2 12 cm; 4 cm

**4a** 1

**b** 20

**c** 0.5

**d** 12

**e** 7.5

**5a** 9

**b** 18

**c** 24

**d** 42 $cm^2$

**e** 119 $m^2$

**f** 45.9 $m^2$

**Page 19**

**1a** 32 $cm^2$

**b** 18 $cm^2$

**c** 22.5 $cm^2$

**d** 24.5 $cm^2$

**2a** 5 cm

**b** 3 cm

**Pages 20–21**

**1** Teacher check.

**2** Teacher check.

**3a** 144 $cm^2$

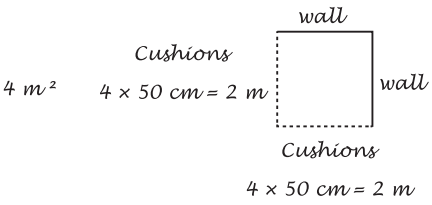
**b** 36 $cm^2$

**c** 24 m

**4** Teacher check.

**Page 22**

**What to do**




**a** 9 $m^2$

**b** 81 $m^2$

**c** 40 m

Total area to be painted:
(3 m × 2.5 m × 2) + (4 m × 2.5 m × 2) – 1 $m^2$ = 34 $m^2$

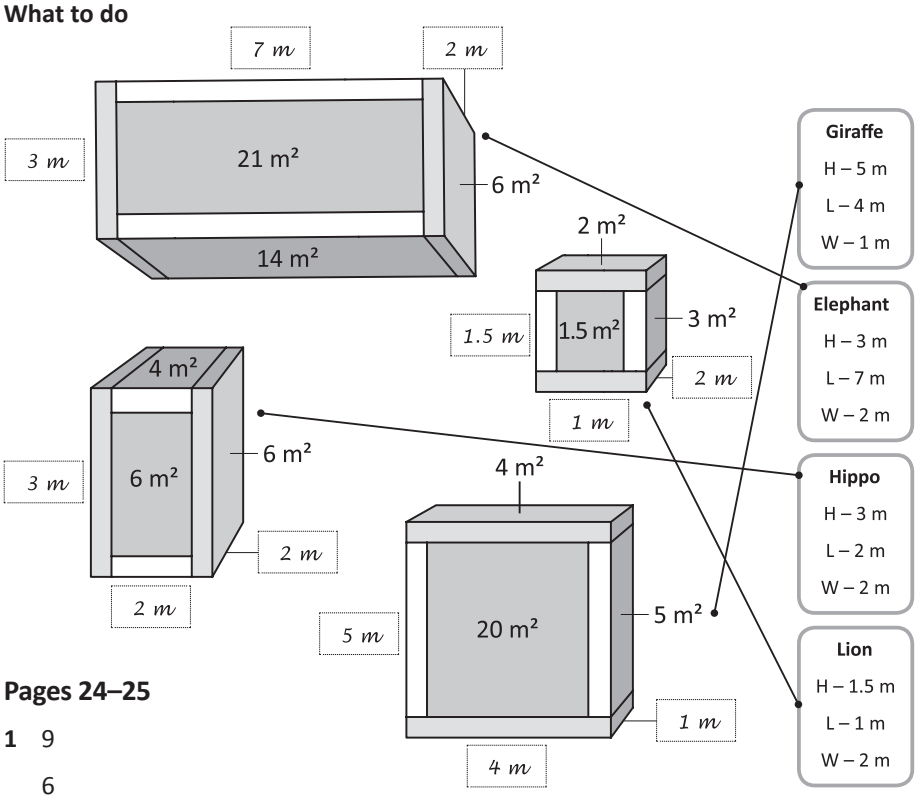
34 $m^2$ ÷ 9 $m^2$ = 3.78
(Paige needs at least 4 pots of paint.)
4 pots = £55 × 4 = £220

Therefore she can do it for under £250.

# Series G – Length, Perimeter and Area

## Page 23

**What to do**




## Pages 24–25

**1** 9
6
3
15
12

**2a** 60

**b** 40

**c** 20

**d** 100

**e** 80

**3** 50

**4** 25

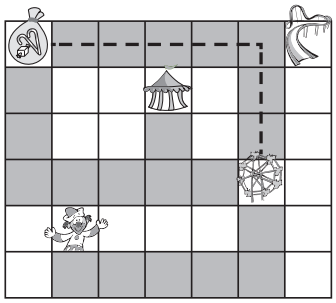
**5a** 250 m

**b** 200 m

**c** 150 m

**d** 350 m

**e**



**6** Teacher check.

**7a** 1 cm = 1 m

**b** 27 m to 28 m

**c** 16 m

**d** 2 m × 3 m

**e** 1 m

**f** 3.5 m

**g** No.

**h** It only has one bedroom and it has a tiny bathroom.

## Pages 26–27

**1a** 4.5 km

**b** 1 km

**c** Walk, because it is only 1 km.

**d** Approx. 7 km

**e** Teacher check.

**2a** 20 km

**b** 50 km

**c** Teacher check.

**d** Teacher check.

**3a** 328 km

**3b** Walford

**c** 428 km

**d** £491

## Pages 28–29

**1a** 76

**b** 82

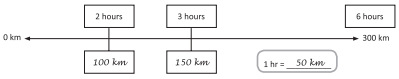
**c** 50

**d** 65

**e** 60

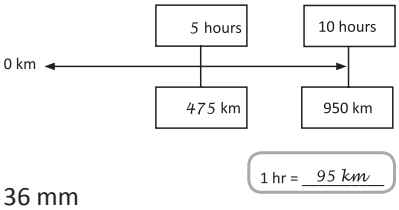
**f** 60

**2**




**3**


**4**




**5** 36 mm

**6** 10 km

**7** 5 hours

**8** 7 hours

**9** 240 minutes or 4 hours

## Pages 30–32

**1a** 60 km/h

**b** 40 km/h

**c** 30 km/h

**d** 65 km/h

**e** 80 km/h

**f** 45 km/h

**2a** 85

**b** 105

**c** 65

**d** 100

**3a** 120 km; 1.5 hours

**b** 160 km; 2 hours

**c** 200 km; 2.5 hours

**d** 40 km; 0.5 hour

# Series G – Length, Perimeter and Area

**Pages 30–32**

**4a** 375 km

**b** 50 km/h

**c** 400 km/h

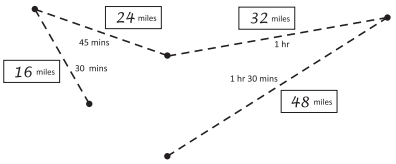
**d** 16 km/h

**e** 40 km

**5a** 21.5 m/h

**b** 48 m/h

**6a**




**b** 24

**c** 300

**7a** true

**b** true

**c** false

**d** true

**e** false

**f** true

**g** false

**h** true

**Page 33**

**What to do**

Observe students.

**What to do next**

Answers will vary.

**Page 34**

**Getting ready**

Answers will vary.

**What to do**

Answers will vary.

**What to do next**

Answers will vary.

**Page 35**

**a** 3 hours

**b** 17 hours

**c** 16 hours

**d** 30 hours

140 km/h

**Page 36**

**What to do**

Teacher check.

# Units of length

Name _____

**1** **Rule a line that is greater than 42 mm but less than 5.6 cm:**

**2** **Put these measurements in order from shortest to longest:**

| | | | | | | |
|---|---|---|---|---|---|---|
| **a** | 42 mm | 40 cm | 0.56 m | | | |
| **b** | 8,400 mm | 5 m | 540 cm | | | |
| **c** | 440 cm | 500 m | 510 mm | | | |

**3** **Express these cm measurements first in mm and then in m:**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **a** | 50 cm | mm | m | **b** | 8,400 cm | mm | m |
| **c** | 112 cm | mm | m | **d** | 1.3 cm | mm | m |

**4** **Xieng, Brendan and Sam are students at Circus School and are bored during a rainy lunch time. They predict that if they stood on each other's heads, the person on the top would be able to touch the ceiling of the lunch shed with his or her head. Xieng measures 1.52 m, Brendan measures 159 cm and Sam measures 134 cm. The ceiling is 4.75 m high.**

**a** Would it be possible? If not, how far off would they be?

_____

**b** What about if the person on the top stood on tippy toes (don't try this out!) and raised themselves 6 cm higher. Would it work then? Explain your thinking:

_____

**5** **Express these cm measurements first in mm and then in m:**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **a** | 5 km | miles | **b** | 3 miles | km | **c** | 112 cm | miles | **d** | 15 miles | km |
|---|---|---|---|---|---|---|---|---|---|---|---|

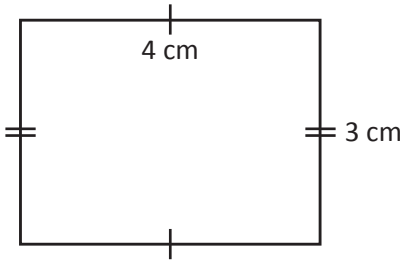
| Skills | Not yet | Kind of | Got it |
|---|---|---|---|
| • Orders lengths of different units | | | |
| • Measures and records lengths in different units | | | |
| • Converts between cm, mm and m | | | |
| • Converts between miles and kilometres | | | |

# Perimeter

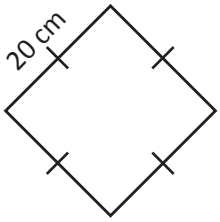
Name _____

**1** **Calculate the perimeter of these shapes:**

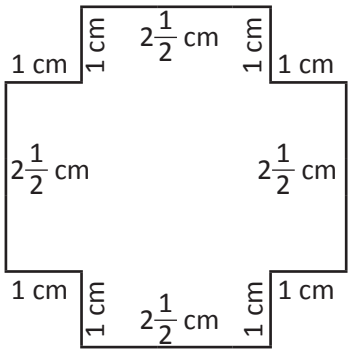
**a**




**b**




**c**




**2** **Find the perimeter of:**

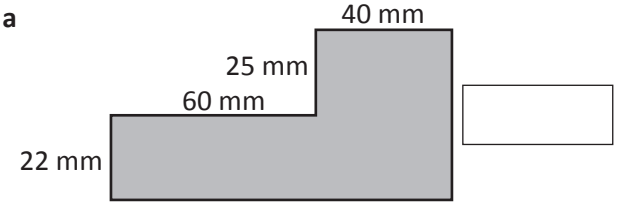
**a** A square with sides measuring 4.2 m. _____

**b** A rectangle measuring 2.5 cm by 7 cm. _____

**c** An equilateral triangle with sides measuring 11.4 cm. _____

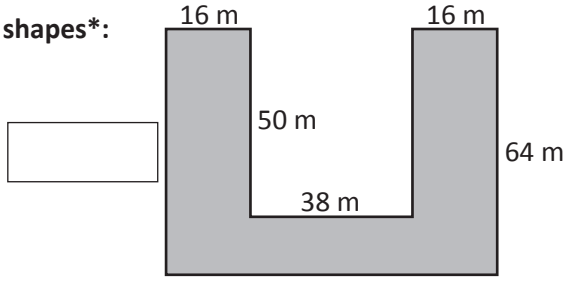
**3** **Find the missing lengths and the total perimeter of these shapes*:**

**a**




P = _____

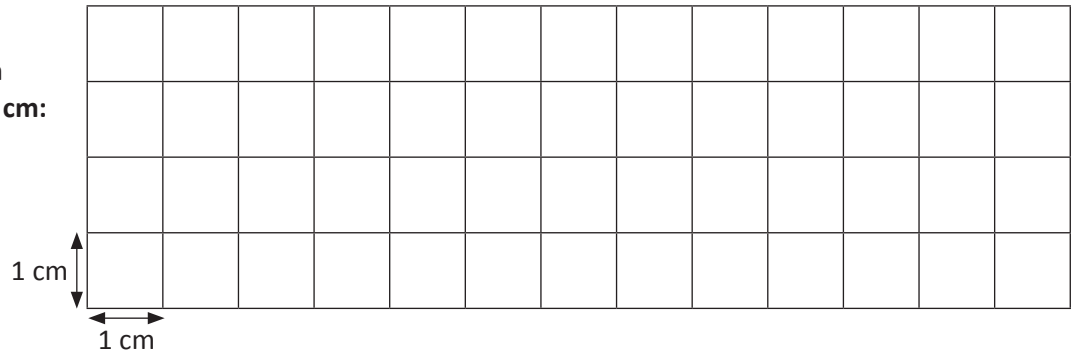
**b**




P = _____

**Not drawn to scale.*

**4** **Draw 2 different shapes, both with a perimeter of 12 cm:**

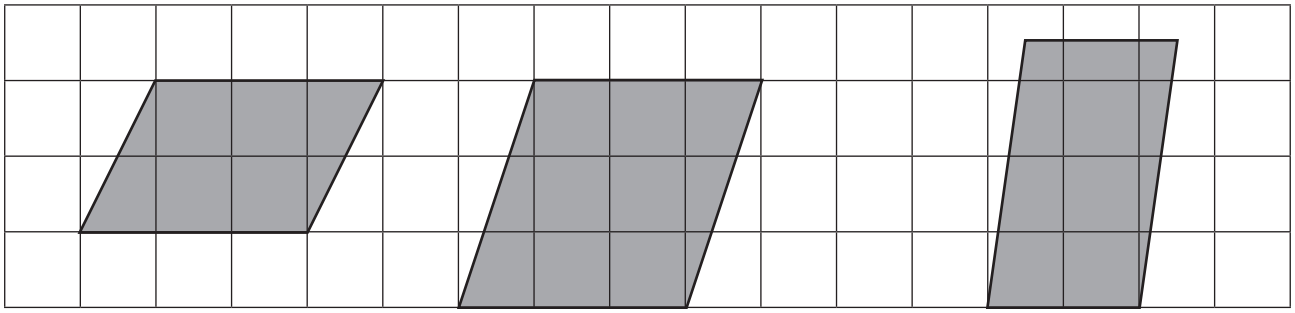



| Skills | Not yet | Kind of | Got it |
|---|---|---|---|
| • Calculates the perimeters of polygons | | | |
| • Calculates missing lengths of sides | | | |
| • Creates shapes with specified perimeters | | | |

# Area

Name _____

**1** **What is the area of each parallelogram? Each square has an area of 1 cm².**



**a** Area = _____ cm²

**b** Area = _____ cm²

**c** Area = _____ cm²

**2** **Find the area of:**

**a** A square with sides of 11 cm _____

**b** A book measuring 32 cm × 12 cm _____

**c** A rectangle measuring 14 cm × 9 cm _____

**d** A towel measuring 2.135 m × 2 m _____

**3** **Name two things:**

**a** You would measure in hectares:

_____

_____

**b** You would measure in cm²:

_____

_____

**c** You would measure in m²:

_____

_____

**d** You would measure in km²:

_____

_____

**4** **Answer these area problems:**

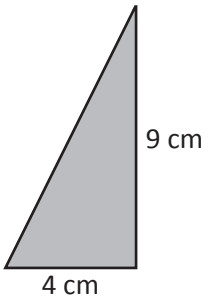
**a** The perimeter of a square is 36 cm. What is its area? _____

**b** Mark is painting the walls of his room. There are 4 walls and each measures 4 m × 2 m. Circle the correct total area:

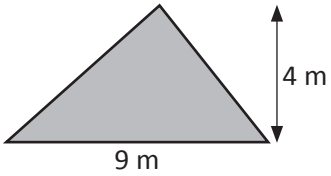
8 m² 12 m 32 m² 48 m²

**5** **How do you find the area of triangles?**

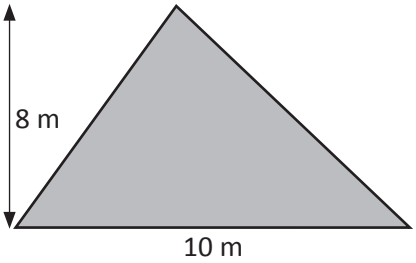
**6** **Find the area of these triangles*:**




**a** Area = ☐ cm²



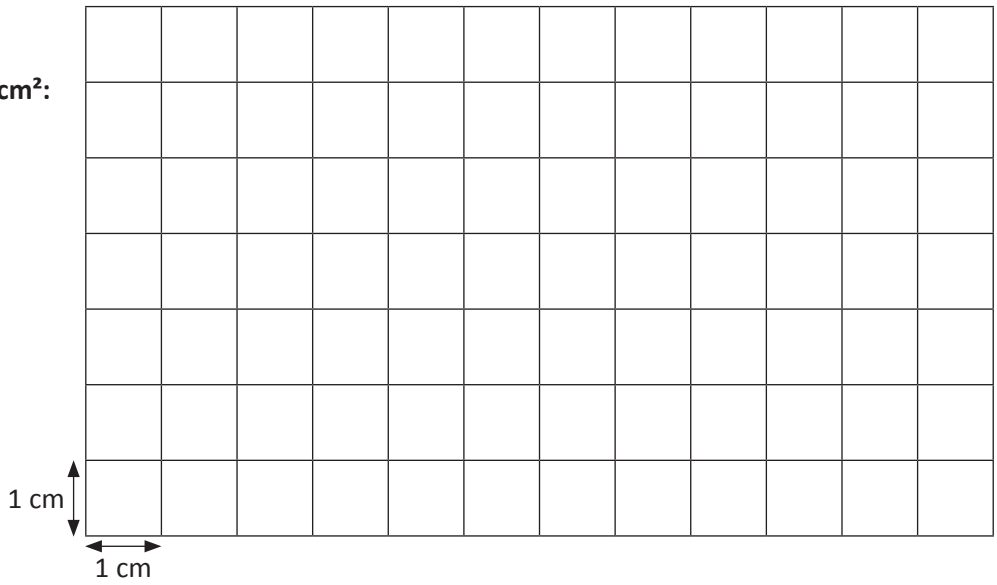

**b** Area = ☐ m²




**c** Area = ☐ m²

**Not drawn to scale.*

**7** **Create 2 shapes with different perimeters but both with an area of 18 cm²:**




**8** **A rectangle has an area of 24 cm². What might its perimeter be?**

| Skills | Not yet | Kind of | Got it |
|---|---|---|---|
| • Finds the area of shapes using grids | | | |
| • Uses formula L × W to find area of rectangles and parallelograms | | | |
| • Finds area of triangles | | | |
| • Makes appropriate unit choices for measuring | | | |
| • Recognises shapes can have same perimeters but different areas | | | |

# Scale and distance

Name _____

**1** **If each cell on the grid to the right represents 4 miles, how long is line:**

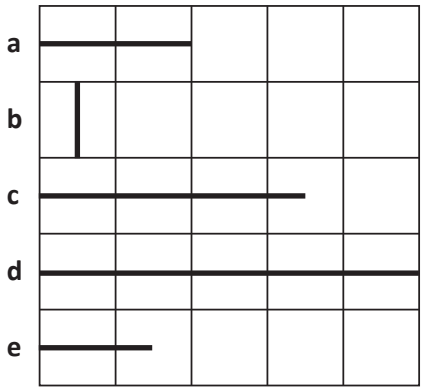
**a** _____ miles

**b** _____ miles

**c** _____ miles

**d** _____ miles

**e** _____ miles



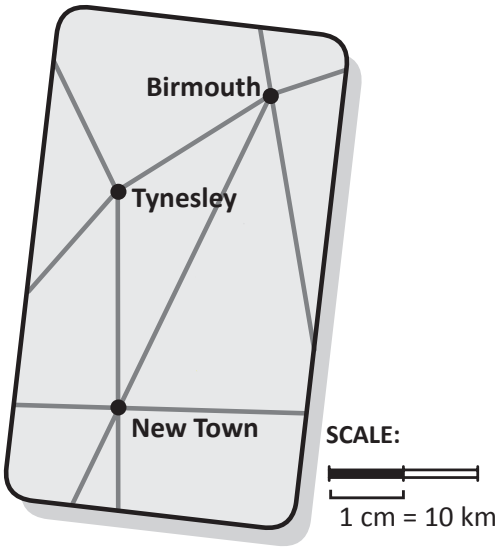

**2** **Use the map below to answer the following questions:**

**a** What is the shortest distance between Birmouth and New Town? _____

**b** If you travelled from Birmouth to New Town via Tynesley, what distance would you travel? _____

**c** A new township called Stone has been built halfway between Birmouth and New Town. Mark it on the map.

**d** How far is Stone from New Town? _____




**3** **Look at the table to the right. It shows the distances of five towns from your current position. Answer the following questions:**

**a** How far is it from Raleigh to Atlanta? _____ miles

**b** What is the distance between Washington and Atlanta? _____ miles

**c** If you travel from your current town to Raleigh in 6 hours, what is your average speed? _____ mph

**d** If you travel at an average speed of 50 mph, how long will it take you to drive to Atlanta? Estimate to the nearest half hour. _____ hours

| | |
|---|---|
| Washington | 75 miles |
| Nashville | 140 miles |
| Raleigh | 300 miles |
| Atlanta | 525 miles |
| San Diego | 2,814 miles |

| Skills | Not yet | Kind of | Got it |
|---|---|---|---|
| • Interprets scales on a map to calculate distance | | | |
| • Solves simple problems using speed | | | |
| • Calculates simple average speeds | | | |

# Series G – Length, Perimeter and Area – Student Progress Record

Name_____ Class _____ Date _____

**What went well:** _____

_____

_____

_____

**What I need to improve:** _____

_____

_____

_____

# Series G – Length, Perimeter and Area – Student Progress Record

Name_____ Class _____ Date _____

**What went well:** _____

_____

_____

_____

**What I need to improve:** _____

_____

_____

_____

# Series G – Length, Perimeter and Area

## ASSESSMENT ANSWERS

### Page 5

**1** Answers will vary.

**2a** 42 mm; 40 cm; 0.56 m

**b** 5 m; 540 cm; 8,400 mm

**c** 510 mm; 440 cm; 500 m

**3a** 500; 0.5

**b** 84,000; 84

**c** 1,120; 1.12

**d** 13; 0.013

**4a** No. 30 cm off.

**b** No. They would still be 24 cm off.

**5a** 3

**b** 4.8

**c** 12

**d** 24

### Page 6

**1a** 14 cm

**b** 80 cm

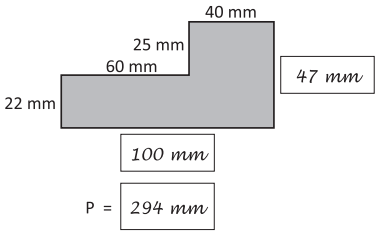
**c** 18 cm

**2a** 16.8 m

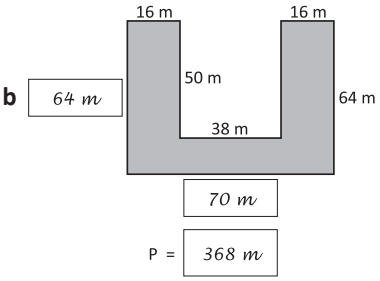
**b** 19 cm

**c** 34.2 cm

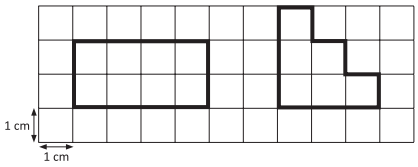
**3a**




**b**




**4** Answers will vary.
Sample answers:




### Pages 7–8

**1a** 6

**b** 9

**c** 7

**2a** 121 $cm^2$

**b** 384 $cm^2$

**c** 126 $cm^2$

**d** 4.27 $m^2$

**3** Answers will vary.
Sample answers:

**a** paddock; park

**b** book; computer screen

**c** bedroom; garden

**d** national park; France

**4a** 81 $cm^2$

**b** 32 $m^2$

**5** (Base × Height) ÷ 2
or

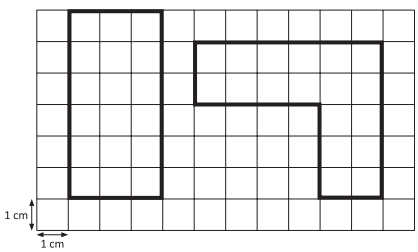
$\frac{1}{2}$ (Base × Height)

**6a** 18

**b** 18

**c** 40

**7** Answers will vary.
Sample answers:




**8** Its perimeter might be 20 cm
(6 cm + 4 cm + 6 cm + 4 cm)
Answers will vary.

### Page 9

**1a** 8

**b** 4

**c** 14

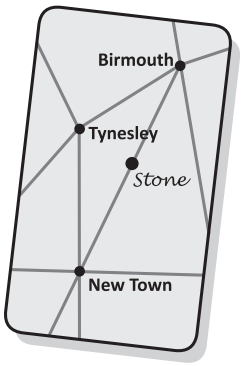
**d** 20

**e** 6

**2a** 42

**b** 47

**c**




**d** 21

**3a** 225

**b** 450

**c** 50

**d** $10\frac{1}{2}$

# Series G – Length, Perimeter and Area

| Topic | Reference | Strand | Objective |
|---|---|---|---|
| **Units of Length** | 6M5 | Measurement | Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places. |
| **Units of Length** | 6M9 | Measurement | Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate. |
| **Perimeter** | 5M7a | Measurement | Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres. |
| **Area** | 6M7b | Measurement | Calculate the area of parallelograms and triangles. |
| **Area** | 6M8b | Measurement | Recognise when it is possible to use formulae for area and volume of shapes. |
| **Area** | 6A2 | Algebra | Use simple formulae. |
| **Scale and Distance** | 6M6 | Measurement | Convert between miles and kilometres. |
| **Scale and Distance** | 6R3 | Ratio and proportion | Solve problems involving similar shapes where the scale factor is known or can be found. |