



5.18F Similar Shapes (Lengths): Foundation Tier Practice

EDEXCEL Edexcel 1MA1 · Calculator allowed · about 50 minutes

Total Marks

Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

- 1** Two similar rectangles have corresponding sides in the ratio 2:5. Write down the scale factor from the smaller rectangle to the larger rectangle.

(Total for Question 1 is 1 mark)

- 2** A triangle is enlarged by a scale factor of 3. One side of the original triangle is 4 cm. Work out the length of the corresponding side on the enlarged triangle.

(Total for Question 2 is 1 mark)

- 3** Two similar triangles have corresponding sides 6 cm and 9 cm. What is the scale factor from the triangle with side 6 cm to the triangle with side 9 cm? Give your answer as a fraction.

(Total for Question 3 is 1 mark)

- 4** Two similar triangles, triangle A and triangle B, have corresponding sides in the ratio 4:7. One side of triangle A is 10 cm. Work out the length of the corresponding side of triangle B.

(Total for Question 4 is 2 marks)

5 Shape P is similar to shape Q. On shape P a side measures 8 cm and the corresponding side on shape Q measures 12 cm.

(a) Find the scale factor from P to Q. (b) A different side on P measures 5 cm. Find the length of the corresponding side on Q.

(a) Find the scale factor from P to Q. (1)

(b) Find the length of the corresponding side on Q. (1)

(Total for Question 5 is 2 marks)

6 Two similar isosceles triangles have corresponding equal sides 9 cm (small) and 12 cm (large). The base of the smaller triangle is 7 cm. Work out the length of the base of the larger triangle.

(Total for Question 6 is 3 marks)

7 Two similar pentagons have corresponding side lengths in the ratio 5:8. The perimeter of the smaller pentagon is 55 cm. Work out the perimeter of the larger pentagon.

(Total for Question 7 is 3 marks)

8 Two similar rectangles have dimensions 6 cm by 10 cm and 9 cm by x cm (corresponding sides). Find x.

(Total for Question 8 is 4 marks)

9 A model car is similar to a real car. The model's length is 18 cm and the real car's length is 4.5 m.

(a) Find the scale factor from the model to the real car. (Write the factor as a ratio model : real.)

(b) Using this scale factor, find the real car's width if the model's width is 5 cm.

(a) Find the scale factor from the model to the real car (model : real). (2)

(b) Using this scale factor, find the real car's width if the model's width is 5 cm. (2)

(Total for Question 9 is 4 marks)

10 Two similar right-angled triangles have corresponding shorter sides 7 cm (small triangle) and 14 cm (large triangle). The hypotenuse of the small triangle is 25 cm. Work out the hypotenuse of the large triangle.

(Total for Question 10 is 4 marks)

- 11** A scale drawing of a garden has scale 1 : 200. On the drawing a path is shown as 3.6 cm long. The actual path is to be extended by a similar path using the same scale. (a) Work out the actual length of the drawn path in metres. (b) If the extended path on the drawing is 6.4 cm, what is the total actual length of both paths in metres?

(a) Work out the actual length of the drawn path in metres. (3)

(b) If the extended path on the drawing is 6.4 cm, what is the total actual length of both paths in metres? (3)

(Total for Question 11 is 6 marks)

- 12** Two similar ladders are drawn on plans. The smaller ladder on the plan is 4 cm long and represents a real ladder of 2 m. The larger ladder on the plan is 9 cm long. (a) Find the scale factor from the plan to real life for the smaller ladder. (b) Use this scale to find the real length of the larger ladder in metres. (c) A third ladder is drawn on the plan at length 6 cm. Using the same scale, find its real length in metres and give the answer to 1 decimal place.

(a) Find the scale factor from the plan to real life for the smaller ladder. (2)

.....
(b) Use this scale to find the real length of the larger ladder in metres. (3)

.....
(c) A third ladder is drawn on the plan at length 6 cm. Using the same scale, find its real length in metres and give the answer to 1 decimal place. (4)

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(Total for Question 12 is 9 marks)

Mark scheme · 5.18F Similar Shapes (Lengths): Foundation Tier Practice

Question 1

- **B1** scale factor $5/2$ or 2.5 cao
- **Answer:** $5/2$ (2.5).

Question 2

- **B1** 12 cm cao
- **Answer:** 12 cm.

Question 3

- **B1** scale factor $9/6 = 3/2$ cao
- **Answer:** $3/2$.

Question 4

- **M1** use $10 \times (7/4)$ or equivalent method
- **A1** 17.5 cm cao
- **Answer:** 17.5 cm.
Working check: $10 \times 7/4 = 70/4 = 17.5$.

Question 5

- (a) **B1** scale factor $12/8 = 3/2$ or 1.5 cao
- (a) **Answer:** $3/2$.
- (b) **B1** 7.5 cm cao
- (b) **Answer:** 7.5 cm.

Question 6

- **M1** find scale factor $12/9 = 4/3$ and apply to base: $7 \times 4/3$
- **M1** calculate $28/3$ or $9.333...$ (method shown)
- **A1** $28/3$ cm or $9.33...$ cm awrt
- **Answer:** $28/3$ cm ($9.33...$ cm awrt 9.33 cm).

Question 7

- **M1** use scale factor $8/5$ on perimeter: $55 \times 8/5$
- **M1** compute $55 \times 8/5 = 11 \times 8 = 88$
- **A1** 88 cm cao
- **Answer:** 88 cm.

Question 8

- **M1** recognise corresponding sides: scale factor $9/6 = 3/2$
- **M1** apply scale to other side: $x = 10 \times 3/2$
- **A1** $x = 15$ cm cao
- **B1** alternative: set up proportion $6/10 = 9/x$ and solve to get 15 cm
- **Answer:** 15 cm.

Question 9

- (a) **M1** convert 4.5 m to 450 cm and form ratio $18 : 450$ or simplify $18/450$
- (a) **A1** $1 : 25$ cao
- (a) **Answer:** $1 : 25$
- (b) **M1** use scale factor $1:25$ so width $= 5 \times 25$
- (b) **A1** 125 cm or 1.25 m cao
- (b) **Answer:** 125 cm (1.25 m).

Question 10

- **M1** find scale factor $14/7 = 2$ and apply to hypotenuse: 25×2
- **M1** calculate 50
- **A1** 50 cm cao
- **B1** state method: corresponding sides scale equally
- **Answer: 50 cm.**

Question 11

- (a) **M1** use scale 1:200 so actual length = $3.6 \text{ cm} \times 200 = 720 \text{ cm}$
- (a) **M1** convert 720 cm to metres: $720/100 = 7.2 \text{ m}$
- (a) **A1** 7.2 m cao
- (a) **Answer: 7.2 m**
- (b) **M1** find actual length of extended path: $6.4 \times 200 = 1280 \text{ cm} = 12.8 \text{ m}$
- (b) **M1** add lengths: $7.2 + 12.8 = 20.0 \text{ m}$
- (b) **A1** 20.0 m cao
- (b) **Answer: 20.0 m**

Question 12

- (a) **M1** convert 2 m to 200 cm and form ratio 4 cm : 200 cm or simplify
- (a) **A1** 1 : 50 cao (or plan:real = 1:50)
- (a) **Answer: 1 : 50**
- (b) **M1** scale 1:50 so real length = $9 \times 50 = 450 \text{ cm}$
- (b) **M1** convert 450 cm to metres: $450/100 = 4.5 \text{ m}$
- (b) **A1** 4.5 m cao
- (b) **Answer: 4.5 m**
- (c) **M1** use scale 1:50 so real length = $6 \times 50 = 300 \text{ cm}$
- (c) **M1** convert 300 cm to metres = 3.0 m
- (c) **A1** 3.0 m cao
- (c) **B1** answer given to 1 d.p. as 3.0 m
- (c) **Answer: 3.0 m (to 1 d.p.)**