FOUNDATION & HIGHER

HIGHER EXTENDS

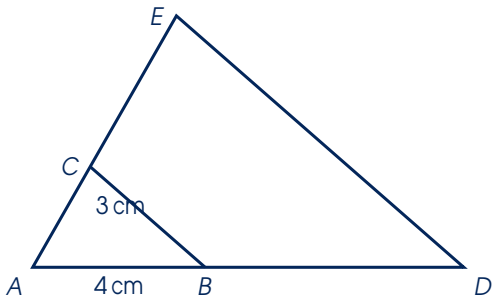
Name ..... Class .....

G19: Similar shapes

Congruence and similarity; lengths, areas and volumes of similar figures

20 marks · 25 minutes · Non-calculator

1) BC is parallel to DE. $AB = 4$ cm, $AD = 10$ cm and $BC = 3$ cm. Find DE.



..... cm

[Question 1: 2 marks]

2) Triangle X has sides 6 cm, 8 cm and 10 cm. Triangle Y is similar, with sides 9 cm, p cm and 15 cm.

(a) Find the scale factor from X to Y.

.....

(1)

(b) Find p.

.....

(1)

[Question 2: 2 marks]

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3) Two similar shapes have corresponding lengths 3 cm and 7.5 cm. The smaller shape has area 20 cm^2. Find the area of the larger shape.

..... cm^2

[Question 3: 2 marks]

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4) Two similar solids have volumes 16 cm^3 and 54 cm^3.

(a) Find the ratio of their lengths.

.....

(2)

(b) The smaller solid has surface area 40 cm^2. Find the surface area of the larger solid.

..... cm^2

(2)

[Question 4: 4 marks]

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5) Two similar bottles have heights 12 cm and 18 cm. The larger bottle holds 810 ml. How much does the smaller bottle hold?

..... ml

[Question 5: 2 marks]

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6) One triangle has angles 40°, 60° and 80°. Another has angles 60°, 80° and 40°. Are they similar?

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[Question 6: 1 marks]

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7) Triangle P has sides 5, 7 and 9 cm. Triangle Q has sides 10, 14 and 17 cm. Are they similar? Show how you decide.

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[Question 7: 2 marks]

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8) In triangle ABC, PQ is parallel to BC, with P on AB and Q on AC. $AP = 3$ cm, $PB = 6$ cm and $PQ = 4$ cm. Find BC.

..... cm

[Question 8: 2 marks]

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9) Two congruent triangles are drawn. One has area 18 cm^2. What is the area of the other?

..... cm^2

[Question 9: 1 marks]

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10) Two similar shapes have areas in the ratio 1 : 49. What is the scale factor for their lengths?

.....

[Question 10: 1 marks]

11) A shape of area 36 cm^2 is enlarged by scale factor $\frac{1}{2}$. Find the area of the image.

..... cm^2

[Question 11: 1 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	7.5	Scale factor 2.5 (M1); A1.
2	(a) 1.5 (b) 12	B1 each.
3	125	Area factor 2.5^2 (M1); A1.
4	(a) 2 : 3 (b) 90	(a) $\sqrt[3]{\frac{16}{54}} = \frac{2}{3}$ (M1); A1. (b) $40 \times \frac{9}{4}$ (M1); A1.
5	240	$810 \div 1.5^3$ (M1); A1.
6	Yes	B1.
7	No	$5 \times 2 = 10$, $7 \times 2 = 14$ but $9 \times 2 = 18 \neq 17$ (M1); no (A1).
8	12	Scale factor 3 (M1); A1.
9	18	B1.
10	7	B1.
11	9	B1.