

Congruence and Similarity

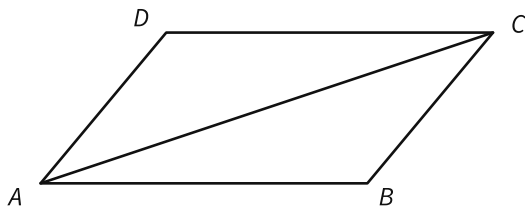
ANSWERS

Calculator | 30 minutes | Total marks: 28

Name

Class

- 1 $ABCD$ is a parallelogram.



Prove that triangle ABC is congruent to triangle CDA .

$AB = CD$, opposite sides of a parallelogram (1)

$BC = DA$, opposite sides of a parallelogram (1)

AC is common, so congruent by SSS (1)

[3 marks]

- 2 (a) Two triangles each have sides of 7 cm and 9 cm with an angle of 50° between them.

Write down the condition that shows the triangles are congruent.

Answer SAS (1)

[1 mark]

- (b) Two triangles each have angles of 40° , 60° and 80° .

Explain why the triangles may not be congruent.

They are the same shape but could be different sizes (1)

[1 mark]

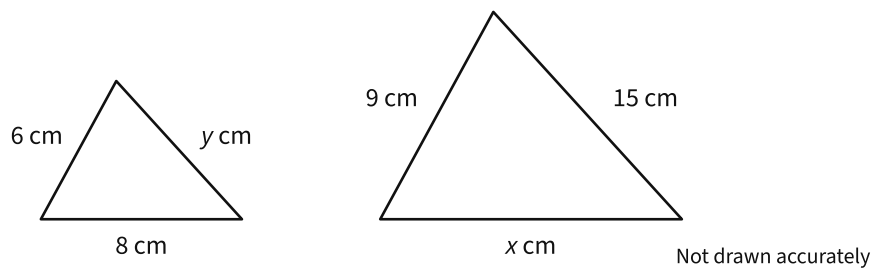
- 3 Complete the table.

Shape	Lines of symmetry	Order of rotational symmetry
Regular hexagon	6 (1)	6 (1)
Parallelogram	0 (1)	2 (1)

[4 marks]

4

The two triangles are similar.



- (a) Work out the value of x .

$$\text{scale factor } 9 \div 6 = 1.5 \quad (1)$$

$$x = 12 \quad (1) \quad [2 \text{ marks}]$$

- (b) Work out the value of y .

$$15 \div 1.5 \quad (1)$$

$$y = 10 \quad (1) \quad [2 \text{ marks}]$$

5

Rectangle P is 6 cm by 4 cm. Rectangle Q is 9 cm by 6 cm.

Are the two rectangles similar?

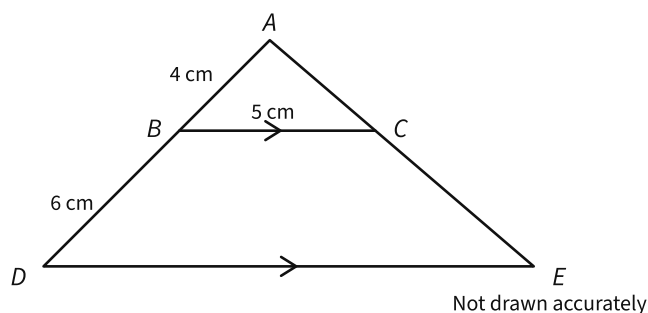
You **must** show your working.

$$9 \div 6 = 1.5 \text{ and } 6 \div 4 = 1.5 \quad (1)$$

Yes, the scale factors are the same (1)

[2 marks]

- 6 BC is parallel to DE .



- (a) Explain why triangle ABC is similar to triangle ADE .

Angle A is common (1)

Angle ABC = angle ADE , corresponding angles, so all the angles are equal (1)

[2 marks]

- (b) Work out the length of DE .

$AD = 10$, scale factor $10 \div 4 = 2.5$ (1)

5×2.5 (1)

Answer 12.5 (1) cm [3 marks]

- 7 Two shapes are similar. The ratio of their lengths is 2 : 5

The area of the smaller shape is 12 cm^2

Work out the area of the larger shape.

area ratio 4 : 25 (1)

$12 \div 4 \times 25$ (1)

Answer 75 (1) cm^2 [3 marks]

- 8 Two solids are similar. Their heights are 4 cm and 6 cm.

The volume of the smaller solid is 80 cm^3

Work out the volume of the larger solid.

length scale factor 1.5 (1)

80×1.5^3 (1)

Answer 270 (1) cm^3 [3 marks]

- 9 Two similar solids have surface areas in the ratio 9 : 25

Write down the ratio of their volumes.

lengths 3 : 5 (1)

Answer 27 : 125 (1) [2 marks]

Question	Topic	RAG
1	I can prove that two triangles are congruent	
2	I know the conditions for congruence	
3	I can describe line and rotational symmetry	
4	I can find missing lengths in similar triangles	
5	I can decide whether two shapes are similar	
6	I can prove triangles are similar and use this to find a length	
7	I can use an area scale factor	
8	I can use a volume scale factor	
9	I can link length, area and volume ratios	