# 4.18 Congruence and Similarity: Test Pack

Calculators not allowed · about 60 minutes

Name: _____ Date: ____ / ____ / _____

**Answer ALL questions. Show all your working.**

**1** State whether the following pair of triangles are congruent: Triangle PQR and triangle XYZ, where P matches X, Q matches Y, R matches Z, and all three corresponding sides are equal in length.

**(1)**

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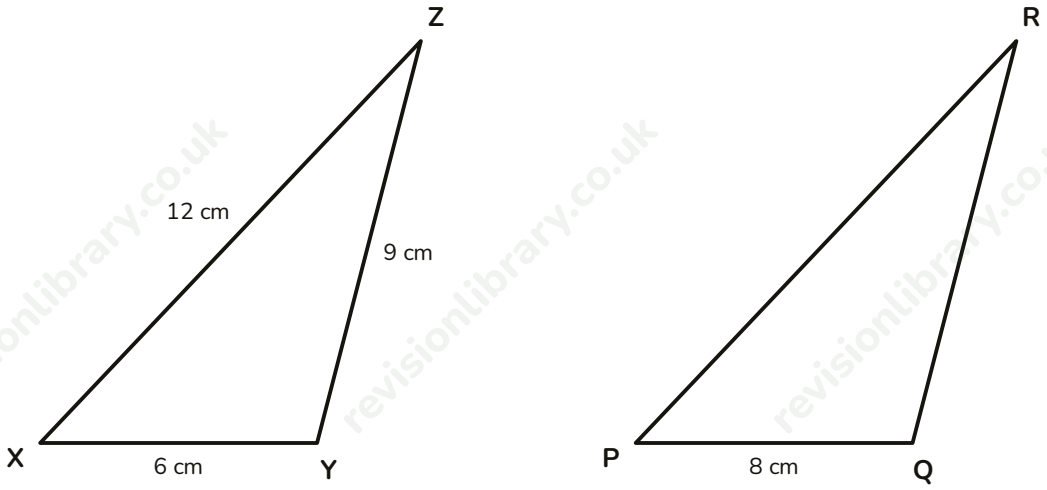
**2** Triangles PQR and STU have PQ = 5 cm, QR = 7 cm, PR = 8 cm and ST = 5 cm, TU = 7 cm, SU = 8 cm. Are the triangles congruent or just similar? Give a brief reason.

**(2)**


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**3** Triangles XYZ and PQR are similar. In triangle XYZ, XY = 6 cm, YZ = 9 cm. In triangle PQR, PQ = 8 cm and QR corresponds to YZ. Find PR in triangle PQR given that PR corresponds to XZ which is 12 cm in triangle XYZ.

Diagram NOT accurately drawn




**(4)**

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**4** A shape is enlarged by scale factor 5. A side of length 4 cm on the original shape is enlarged. What length is the matching side on the image?

**(1)**

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**5** A vertical pole 3 m tall casts a shadow 6 m long. At the same time a tree casts a shadow 12 m long. Work out the height of the tree.

**(3)**


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**6** Two rectangles are similar. The smaller has sides 6 cm and 12 cm. The larger has a side of 15 cm that matches the 6 cm side. Work out the length of the other side of the larger rectangle.

**(3)**

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**7** A vertical pole 3 m tall casts a shadow 3 m long. At the same time a tree casts a shadow 24 m long. Work out the height of the tree.

**(3)**

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**8** Two similar shapes have corresponding lengths in the ratio 1 : 3. The smaller shape has an area of 8 cm². Work out the area of the larger shape.

**(3)**


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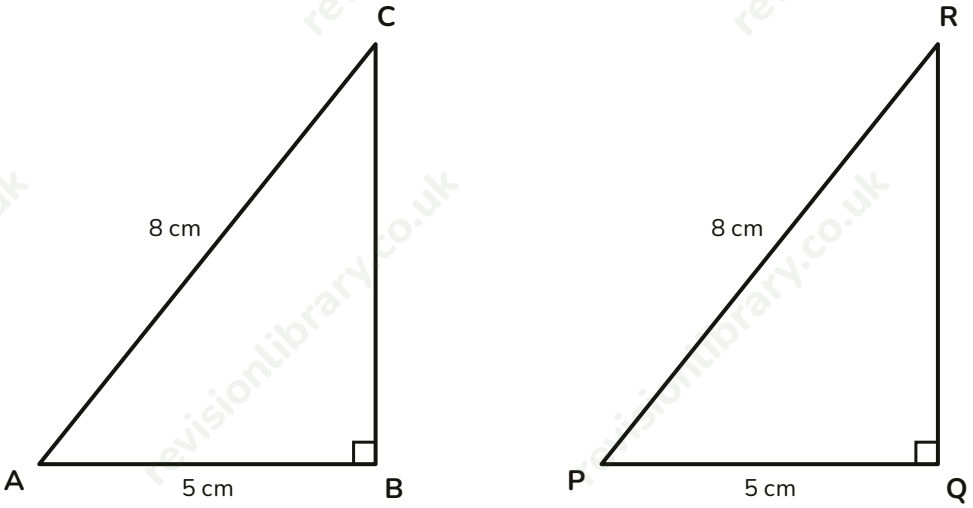
**9** Two similar shapes have corresponding lengths in the ratio 1 : 4. The smaller shape has an area of 11 cm². Work out the area of the larger shape.

**(3)**

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**10** Triangle ABC has a right angle at B, hypotenuse AC = 8 cm and AB = 5 cm. Triangle PQR has a right angle at Q, hypotenuse PR = 8 cm and PQ = 5 cm.
Are the two triangles congruent? Give a reason for your answer.

Diagram NOT accurately drawn

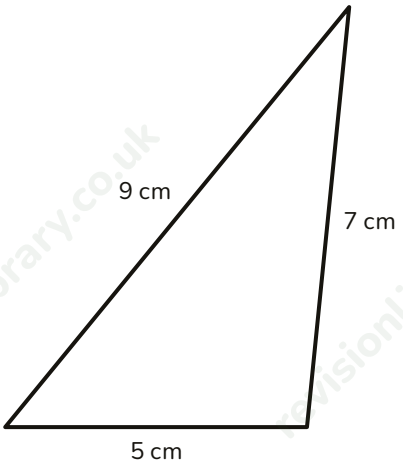


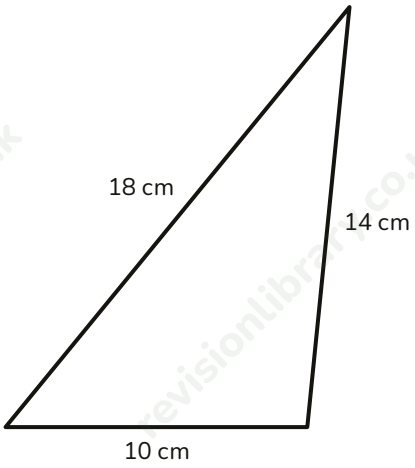

**(2)**


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**11** A triangle has sides 5 cm, 7 cm and 9 cm. A second triangle has sides 10 cm, 14 cm and 18 cm. Are the triangles similar? Explain briefly.

Diagram NOT accurately drawn

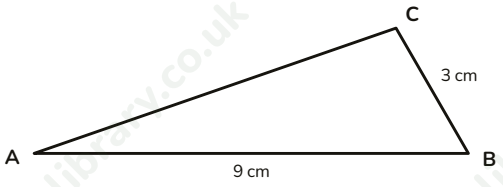


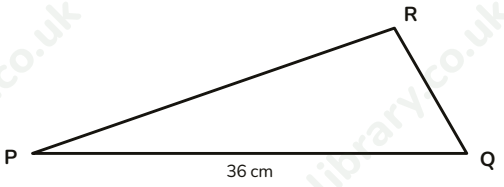




(2)

**12** Triangle ABC is similar to triangle PQR. AB = 9 cm matches PQ = 36 cm. BC = 3 cm. Work out the length of QR.

Diagram NOT accurately drawn




(3)


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**13** Two similar shapes have corresponding lengths in the ratio 1 : 5. The smaller shape has an area of 9 cm². Work out the area of the larger shape.

**(3)**

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**14** Triangle A has sides 2 cm, 3 cm and 4 cm. Triangle B is an enlargement of A with scale factor 3. Work out the perimeter of triangle B.

**(3)**

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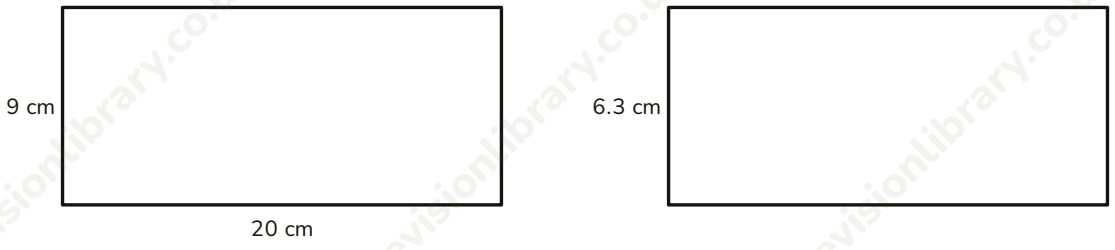
**15** State whether the following pair of triangles are congruent: Triangle DEF and triangle UVW, where D matches U, E matches V, F matches W, and all three corresponding sides are equal in length.

**(1)**

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**16** A rectangle measures 9 cm by 20 cm. A similar rectangle has its shorter side 6.3 cm. Find the longer side of the similar rectangle. Give your answer to 1 decimal place.

Diagram NOT accurately drawn




**(3)**


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**17** Write down whether the pair of shapes are similar or not: two rectangles, one 4 cm by 8 cm and the other 8 cm by 16 cm.

**(1)**

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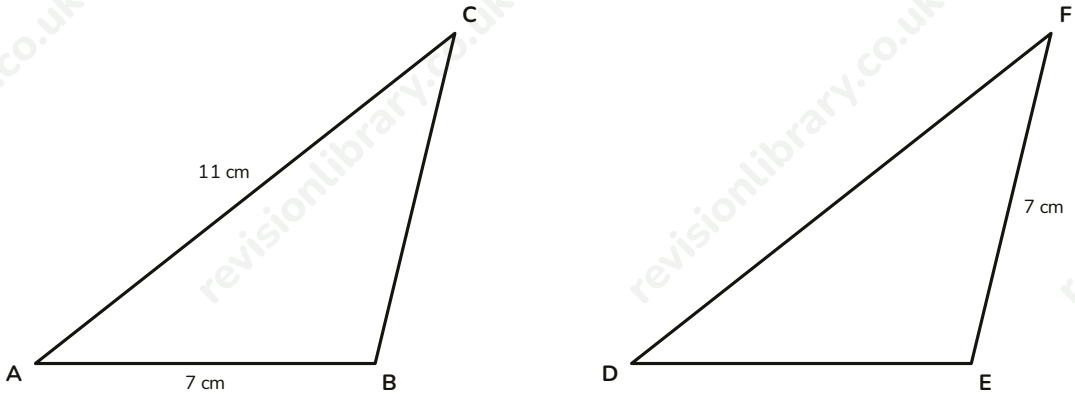
**18** A small model of a building is similar to the real building with scale 1:200. On the model the tower height is 5 cm. Find the actual tower height in metres.

**(2)**

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**19** Triangle ABC is congruent to triangle DEF. Point B corresponds to E. If AB = 7 cm and EF = 7 cm, give the length of DE if AC = 11 cm and DF corresponds to AC.

Diagram NOT accurately drawn




**(2)**


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# Mark scheme · 4.18 Congruence and Similarity: Test Pack

## Question 1

Correct statement: yes, they are congruent (SSS) cao **B1**

Answer: **Yes, they are congruent (SSS).**

## Question 2

Recognise that all three corresponding sides are equal **M1**

State congruent by SSS cao **A1**

Answer: **Congruent, because all three corresponding sides are equal (SSS).**

## Question 3

Use the corresponding sides PQ and XY to form the scale factor PQ/XY = 8/6 (or an equivalent proportion). **M1**

Correct scale factor 4/3 from XYZ to PQR, explicit or implied by a correct proportion. No calculation of QR is required. **A1**

Apply same scale factor to XZ: PR = 12 x 4/3 = 16 **M1**

Final answer PR = 16 cm cao **A1**

Answer: **16 cm**

## Question 4

20 cm cao **B1**

Answer: **20 cm**

## Question 5

similar triangles identified, scale factor from the shadows **M1**

3 x 2 **M1**

6 m cao **A1**

Answer: **6 m**

## Question 6

scale factor 15 ÷ 6 = 2.5 **M1**

12 x 2.5 **M1**

30 cm cao **A1**

Answer: **30 cm**

## Question 7

similar triangles identified, scale factor from the shadows **M1**

3 x 8 **M1**

24 m cao **A1**

Answer: **24 m**

## Question 8

area scale factor $3^2 = 9$ **M1**

8 x 9 **M1**

72 cm² cao **A1**

Answer: **72 cm²**

## Question 9

area scale factor $4^2 = 16$ **M1**

11 x 16 **M1**

176 cm² cao **A1**

Answer: **176 cm²**

## Question 10

compares corresponding sides and angles **M1**

Yes, RHS (right angle, hypotenuse and one other side) **A1**

Answer: **Yes, RHS (right angle, hypotenuse and one other side)**

## Question 11

Shows side ratios are equal: 10/5 = 14/7 = 18/9 = 2 or equivalent **M1**

States they are similar with scale factor 2 cao **A1**

Answer: **Yes. All corresponding sides have ratio 2, so similar with scale factor 2.**

## Question 12

scale factor 4 **M1**

3 x 4 **M1**

12 cm cao **A1**

Answer: **12 cm**

## Question 13

area scale factor $5^2 = 25$ **M1**

9 x 25 **M1**

225 cm² cao **A1**

Answer: **225 cm²**

## Question 14

perimeter of A = 9 **M1**

x 3 **M1**

27 cm cao **A1**

Answer: **27 cm**

## Question 15

Correct statement: yes, they are congruent (SSS) cao **B1**

Answer: **Yes, they are congruent (SSS).**

## Question 16

Find scale factor: 6.3/9 = 0.7 **M1**

Multiply 20 by 0.7 to get 14 **M1**

Answer 14.0 cm or 14.0 cao **A1**

Answer: **14.0 cm**

## Question 17

Correct statement: similar, sides are in proportion 1:2 cao **B1**

Answer: **Similar (scale factor 2).**

## Question 18

Method: multiply 5 cm by 200 to get real height in cm, 5 x 200 = 1000 cm **M1**

Correct conversion to metres: 10 m cao **A1**

Answer: **10 m**


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## Question 19

| | |
|---|---|
| Use congruence: corresponding sides equal, so DE corresponds to AB | **M1** |
| Correct length: DE = 7 cm cao | **A1** |

Answer: **7 cm**


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