Similar Shapes and Congruence

GCSE Mathematics • **Higher Tier** • Grades 6–7 • Non-calculator

Name: _____ Class: _____ Total: _____ / 51

Show all your working. Marks are given for correct method as well as the final answer.

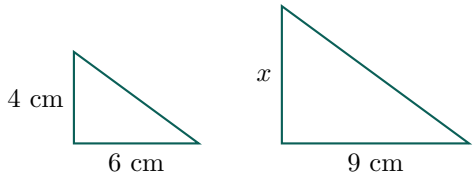
1. Two similar shapes have corresponding sides 4 cm and 12 cm. Write down the scale factor. **[1 mark]**

Answer: _____

2. Two similar rectangles have corresponding sides 5 cm and 8 cm. Write down the scale factor. **[2 marks]**

Answer: _____

3. Work out x in the similar triangles. **[3 marks]**



Answer: _____ **cm**

4. Shape B is similar to shape A with scale factor 4. A side of 7 cm on A becomes what on B? **[2 marks]**

Answer: _____ **cm**

5. Shape B is similar to A with scale factor 2.5. A side of 20 cm on B came from what side on A? **[2 marks]**

Answer: _____ **cm**

6. Explain why all circles are similar. **[2 marks]**

Answer: _____

7. Two similar shapes have scale factor 3. Write down the area scale factor. **[2 marks]**

Answer: _____

8. Shape A has area 12 cm^2. Shape B is similar with scale factor 2. Work out the area of B. **[3 marks]**

Answer: _____ **cm^2**

9. Shape A has area 20 cm^2 and shape B, similar to A, has area 180 cm^2. Work out the length scale factor. **[3 marks]**

Answer: _____

10. Two similar triangles have sides in the ratio 2 : 5. Write down the ratio of their areas. **[2 marks]**

Answer: _____

11. Two similar solids have scale factor 2. Write down the volume scale factor. **[2 marks]**

Answer: _____

12. Solid A has volume 50 cm^3. Solid B is similar with scale factor 3. Work out the volume of B. **[3 marks]**

Answer: _____ **cm^3**

13. Two similar solids have volumes 8 cm^3 and 125 cm^3. Work out the length scale factor. **[3 marks]**

Answer: _____

14. Two similar cylinders have radii 3 cm and 6 cm. The smaller has volume 90 cm^3. Work out the volume of the larger. **[4 marks]**

Answer: _____ **cm^3**

15. Two similar cones have surface areas 16π and 144π cm^2. Work out the length scale factor. **[3 marks]**

Answer: _____

16. Write down the four conditions for two triangles to be congruent. **[4 marks]**

Answer: _____

17. Explain the difference between congruent and similar shapes. **[2 marks]**

Answer: _____

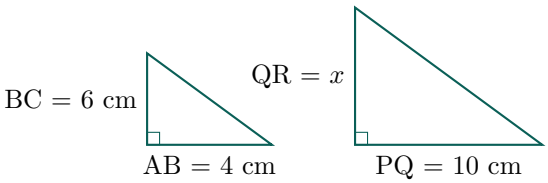
18. Two triangles have sides $5, 6, 7$ and $5, 6, 7$. Which congruence condition applies? **[1 mark]**

Answer: _____

19. Two right-angled triangles have hypotenuse 13 cm and one side 5 cm each. Which condition applies? **[2 marks]**

Answer: _____

20. In triangles ABC and PQR, angle A = angle P and angle B = angle Q. $AB = 4$ cm and $PQ = 10$ cm.



(a) Explain why the triangles are similar. **[2 marks]**

(b) $BC = 6$ cm. Work out QR. **[3 marks]**

Answer: _____

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