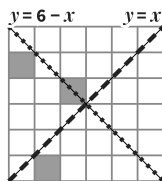


1 Lines of symmetry

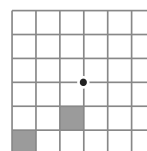
- a) Shade more squares so that the line $y = x$ is a line of symmetry.
- b) How many more squares must you then shade so that $y = 6 - x$ is a line of symmetry too?



- a) 3 squares
- b) 4 more squares

2 Rotational symmetry

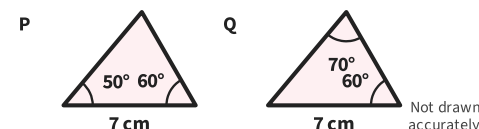
- a) Shade the fewest squares so that the pattern has rotational symmetry of order 4 about the dot. How many did you shade?
- b) A regular polygon has rotational symmetry of order 12. Work out the size of each interior angle.



- a) 6 squares
- b) exterior $360 \div 12 = 30^\circ$, interior 150°

3 Congruent triangles

- a) Are triangles P and Q congruent? Explain how you know.
- b) Explain why two triangles with the same three angles need not be congruent.

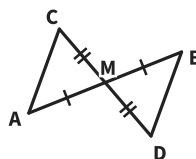


- a) yes: P's third angle is 70° , so AAS
- b) one can be an enlargement of the other

4 Congruent triangles

AB and CD cross at M, the midpoint of both.

- a) Prove that triangles AMC and BMD are congruent.
- b) Explain why AC is parallel to DB.



- a) $AM = MB$, $CM = MD$, angle $AMC = BMD$: SAS
- b) angle $CAM =$ angle DBM are alternate angles

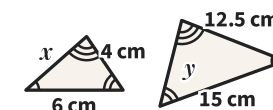
Congruence, symmetry and similarity

revision mat answers

5 Similar shapes: missing lengths

The two triangles are similar. Equal angles are marked the same.

- a) Find x .
- b) Find y .

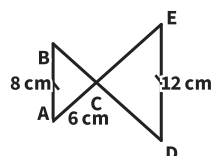


- 6 cm matches 15 cm: scale factor $15 \div 6 = 2.5$
- a) $x = 12.5 \div 2.5 = 5$ cm
- b) $y = 4 \times 2.5 = 10$ cm

6 Similar shapes: missing lengths

AB is parallel to DE. AE and BD cross at C. $BD = 15$ cm.

- a) Find CE.
- b) Find BC.



Not drawn accurately

- similar triangles, scale factor $12 \div 8 = 1.5$
- a) $CE = 6 \times 1.5 = 9$ cm
- b) $BC : CD = 1 : 1.5$, $BC = 15 \div 2.5 = 6$ cm

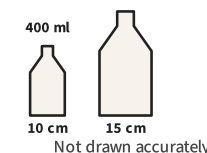
7 Area and volume scale factors

- a) A photo is enlarged so that its area is 9 times as big. How many times as long is its perimeter?
- b) On a map with a scale of 1 : 50 000, a lake has an area of 6 cm^2 . Work out the real area of the lake in km^2 .

- a) $\sqrt{9} = 3$ times as long
- b) 1 cm is 0.5 km, so 1 cm^2 is 0.25 km^2
- $6 \times 0.25 = 1.5 \text{ km}^2$

8 Area and volume scale factors

- a) Two similar bottles are 10 cm and 15 cm tall. The small one holds 400 ml. How much does the large one hold?
- b) A model of a statue is made to a scale of 1 : 20. Its surface area is 150 cm^2 . Find the statue's surface area in m^2 .



- a) $(1.5)^3 = 3.375$, $400 \times 3.375 = 1350$ ml
- b) $150 \times 20^2 = 60\,000 \text{ cm}^2 = 6 \text{ m}^2$