Year 9 Bearings and Transformations – Challenge

ANSWER KEY HappyKids.fit

Answers and worked solutions · 8 questions

A. Think like a mathematician

1. a reflection in the line y = 1

(–3, –3) → (–3, 5), (1, –2) → (1, 4), (1, 0) → (1, 2)
Test how the coordinates change: a reflection in the line y = 1
Check: same shape and size (congruent)

2. a reflection in the line y = –1

(–3, 1) → (–3, –3), (1, 1) → (1, –3), (0, –1) → (0, –1)
Test how the coordinates change: a reflection in the line y = –1
Check: same shape and size (congruent)

3. No. The enlargement changes every length, so the image is similar to S but not congruent.

Reflections, rotations and translations do not change lengths or angles
An enlargement multiplies lengths by the scale factor
Decide: not congruent (similar)

4. Both length and width are multiplied by 4, so the area is multiplied by $4^2 = 16$: 176 cm^2.

Error: the area scale factor is the square of the length scale factor
$4^2 = 16$
$16 \times 11 = 176$ cm^2

5. Yes. It is halfway along the segment, so it lies on it.

Try an example
It is halfway along the segment, so it lies on it.
Decide

6. scale factor 3; width 12 cm

Area scale factor = 288 ÷ 32 = 9
Length scale factor = √9 = 3
Width = 3 × 4 = 12 cm

7. 9 cm; 333°

900 ÷ 100 = 9 cm
Back bearing: 333°

8. scale factor 2; centre (–5, 0)

Compare a pair of sides: each side of B is 2 times as long
Draw lines through matching corners; they meet at the centre
Centre (–5, 0): e.g. (–5, 0) → (0, 0) is (5, 0), and × 2 reaches (5, 0)