

Transformations Enlargement

GCSE Maths · Written to the shared content for AQA, Edexcel and OCR

Name _____ Class _____ Date _____

1. Worked example

Enlarge the triangle A(1, 1), B(3, 1), C(1, 2) by scale factor 2, centre (0, 0).

Step 1 · From the origin, multiply each coordinate by 2

A'(2, 2), B'(6, 2), C'(2, 4)

Step 2 · Check a length

AB = 2, A'B' = 4

Answer: A'(2, 2), B'(6, 2), C'(2, 4)

Check: Every length has doubled and the angles are unchanged ✓

2. Now try one with the steps

Enlarge the triangle (4, 2), (8, 2), (4, 6) by scale factor $\frac{1}{2}$, centre (0, 0).

Step 1 · Multiply each coordinate by $\frac{1}{2}$

Step 2 · Compare sizes

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. Translate the point (3, 4) by the vector (2, -5) (2 right, 5 down). [1]

2. Reflect the point (3, 4) in the x-axis. [1]

3. Reflect the point (3, 4) in the line $y = x$. [1]

4. Rotate the point (3, 4) by 90° anticlockwise about the origin. [1]

5. Rotate the point (3, 4) by 180° about the origin. [1]
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6. Enlarge the point (2, 3) by scale factor 3, centre the origin. [1]
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7. Enlarge the point (4, 6) by scale factor $\frac{1}{2}$, centre the origin. [1]
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8. Enlarge the point (5, 3) by scale factor 2, centre (1, 1). [2]
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9. A shape has a side of 6 cm. It is enlarged by scale factor $\frac{1}{3}$. How long is the side on the image, in cm? [1]
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10. An enlargement with scale factor 2.5 is applied to a 4 cm side. How long is the image side, in cm? [1]
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11. (2, 1) maps to (6, 3) and (3, 1) maps to (9, 3). Describe fully the single transformation. [2]
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12. Enlarge the point (3, 2) by scale factor -1 , centre the origin. [1]
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13. Enlarge the point (4, 1) by scale factor -2 , centre (2, 1). [2]
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14. Which single transformation has the same effect enlargement with scale factor -1 , centre the origin? [1]
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15. The point (3, 4) is reflected in the y-axis and then translated by the vector (2, 1). Where does it end up? [2]
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4. Before you hand it in

'Rotation 90°' full description

A rotation needs all three: angle, direction (clockwise/anticlockwise) and centre, e.g. 'rotation 90° clockwise about (0, 0)'.

Enlarging (5, 3) by 2 about (1, 1) as (10, 6)

Multiply the distance FROM THE CENTRE: $(1, 1) + 2 \times (4, 2) = (9, 5)$.

A scale factor of $\frac{1}{2}$ makes the image twice

Lengths are multiplied by $\frac{1}{2}$, so the image is half the size.

Scale factor -2 drawn on the same side of the centre

The negative sign sends each image point through the centre to the opposite side, twice away.