

Transformations

KS3 Maths · Follows the national curriculum

Name _____ Class _____ Date _____

1. Worked example

Reflect the point (4,2) in the y-axis.

Step 1 · Identify the reflection rule

Reflecting in the y-axis: $x \rightarrow -x$, y stays the same

Step 2 · Apply to the point

$(4,2) \rightarrow (-4,2)$

Answer: $(-4,2)$

Check: The y-axis is the mirror line — distance from it is preserved on the other side ✓

2. Now try one with the steps

Rotate the point (3, 1) through 90° clockwise about the origin.

Step 1 · Use the rule for 90° clockwise about the origin

Step 2 · Apply it

Step 3 · Check with a sketch or tracing paper

Answer:

3. Practice

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

1. Describe the transformation that takes a shape from (2,3) to $(2,3)+(4,-1) = (6,2)$. [2]

2. A point (3,5) is reflected in the x-axis. Find its new coordinates. [1]

3. A shape is rotated 90° clockwise about the origin. State what happens to a point (x,y). [2]

4. A triangle is enlarged by scale factor 3 from the origin. A point (2,1) on the original triangle — find its image. [2]

5. Describe fully the single transformation that maps triangle A (with vertices at (1,1),(3,1),(1,4)) onto triangle B (with vertices at (1,-1),(3,-1),(1,-4)). [3]

6. A shape is enlarged by scale factor $\frac{1}{2}$ from a centre of enlargement (0,0). What happens to the shape's size and is this still called an 'enlargement'? [3]

7. Translate the point (1, 4) by the vector (3, -2). Write the new coordinates. [1]

8. Reflect the point (-2, 5) in the y-axis. [1]

9. Enlarge the point (1, 3) by scale factor 2 with centre the origin. [1]

10. Rotate the point (2, 3) through 180° about the origin. [1]

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

12. Describe the translation that moves (5, -1) to (2, 3). Give the vector. [2]

13. Rotate the point (4, 1) through 90° anticlockwise about the origin. [2]

14. Which three transformations always give an image congruent to the original shape? [1]

15. A 3 cm by 5 cm rectangle is enlarged by scale factor 4. Find the perimeter of the image. [2]

16. Reflect the point (4, 2) in the line $x = 1$. [2]

17. Triangle T has corners (2, 2), (4, 2) and (2, 5). Enlarge it by scale factor 2 with centre (1, 1). Write the new corners. [3]

4. Before you hand it in

Describing a transformation as 'it moved' without specifying the type and full details

Always specify: the TYPE of transformation (translation/rotation/reflection/enlargement) AND its full details — vector for translation, angle+direction+centre for rotation, mirror line for reflection, scale factor+centre for enlargement.

Forgetting the centre of rotation or enlargement when describing a transformation

A rotation needs: angle, direction (clockwise/anticlockwise), AND centre of rotation. An enlargement needs: scale factor AND centre of enlargement. All three are required for full marks.

Reading the vector (3, -2) as '3 up and 2 left'

The top (first) number is always the horizontal move: positive = right, negative = left. The bottom (second) number is the vertical move: positive = up, negative = down. So (3, -2) is 3 right and 2 down.