Guide to:
Negative scale factors

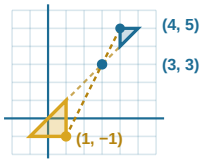
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Explanation:

An enlargement with a **negative scale factor (−k)** enlarges the shape by factor **k** on the **opposite side of the centre of enlargement** and turns the image upside down (rotated by 180°).

Count the vector movement (squares across and up/down) from the **centre of enlargement** to each vertex of the object, multiply that vector by the negative scale factor, and count the new movement **from the centre of enlargement**.

Example 1: Shape A has a corner at **(4, 5)**. It is enlarged by scale factor **−2** about the centre **(3, 3)**. Find the new coordinates of this corner.



Solution:

From (3, 3) to (4, 5) is **(1, 2)**; multiply by −2 → **(−2, −4)**
From centre: (3 − 2, 3 − 4) = **(1, −1)**
Answer: (1, −1)

Example 2: Triangle P (base 2 units) maps onto inverted Triangle Q (base 3 units). Ray lines through matching corners cross at **(2, 1)**. Describe the transformation.

Solution:

1. Transformation type: **Enlargement**
2. Inverted and 3 ÷ 2 = 1.5 → **scale factor −1.5**
3. Ray lines intersect at **centre (2, 1)**

Answer: Enlargement, scale factor −1.5, centre (2, 1)

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