

Negative scale factors

Pearson Edexcel GCSE Mathematics 1MA1 • L030

Higher-only content • 10-minute alternative route • Lesson resources

REACH FOR THE STAR | GCSE MATHEMATICS

Higher route: replace the 2-minute A3 feedback and the two 4-minute Challenge discussions with this 10-minute taught extension. Retain core P1–P2. Set HX1–HX2 as the final four minutes of that alternative, and use the shared challenges later if needed. The core route remains 60 minutes; the extension is not an additional compulsory ten minutes. Route choice reflects tier curriculum, not temporary support needs.

Discover through a worked example

A negative factor puts the image on the opposite side of the centre. For centre $C(1,1)$, point $P(3,2)$ and factor -2 , the displacement $P-C=(2,1)$. Multiply by -2 to get $(-4,-2)$, then add C : $P'=(-3,-1)$. The distance from C doubles; the direction reverses. Use each vertex separately and check a side-length ratio of 2.

H1

Centre $(0,0)$, $P(2,-3)$, factor -1 . Find P' and describe its position.

Optional scaffold: Multiply both displacements by -1 .

H2

Centre $(1,1)$, $P(5,3)$, factor $-1/2$. Find P' .

Optional scaffold: Subtract the centre first, then add it back.

Apply and prove independently

Four marks. Show working. Your teacher reviews the reasoning; these answers are not automatically marked.

HX1

Enlarge $P(3,4)$ about $C(1,1)$ by factor -2 . Show the displacement and image. [2]

HX2

A pupil says factor -1 makes lengths negative. Explain the error and describe the image position. [2]

Next step

Record which step needs practice. Retry a fresh example after a delay. A completed task does not establish mastery.