

# Combining transformations

Pearson Edexcel GCSE Mathematics 1MA1 • L029

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

Reflect  $P(2,3)$  in  $x=0$ :  $(-2,3)$ . Then reflect in  $y=0$ :  $(-2,-3)$ . For any point  $(x,y)$ , the result is  $(-x,-y)$ , equivalent to a  $180^\circ$  rotation about the origin. Reversing these two perpendicular-axis reflections gives the same result. This does not mean every pair of transformations can be reversed without changing the image.

### H1

Reflect  $(4,-1)$  in  $x=0$  then  $y=0$ . Give the intermediate and final coordinates.

Optional scaffold: Change one sign at a time.

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### H2

Translate  $(1,2)$  by  $(3,0)$ , then reflect in  $x=0$ . Now reverse the order. Compare.

Optional scaffold: Record an intermediate point before the second operation.

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## Apply and prove independently

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

### HX1

Reflect (3,5) in  $x=0$  and then  $y=0$ . Give the final point and one equivalent single transformation. [2]

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### HX2

Does translating by (2,0) and reflecting in  $x=0$  give the same result in either order? Use (1,1) to justify. [2]

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## Next step

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