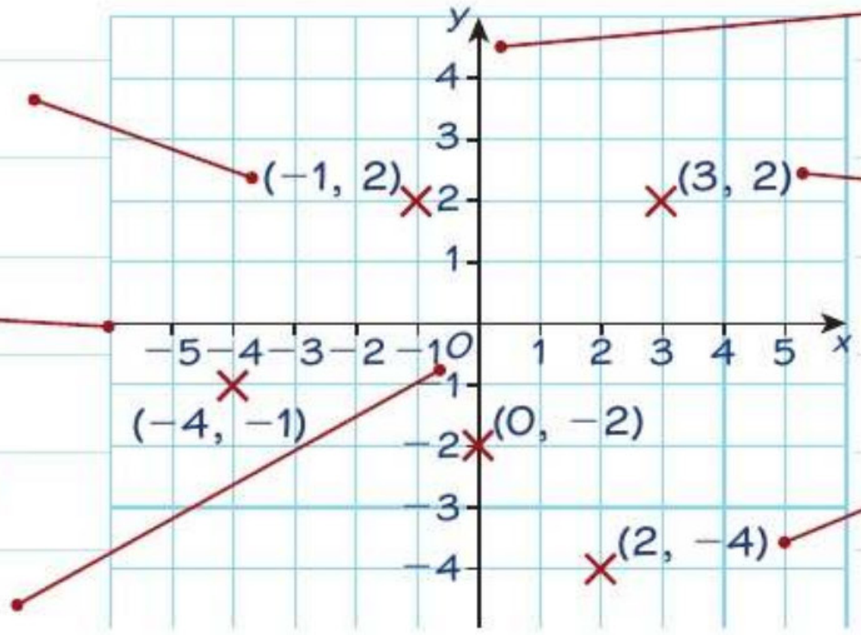
Had a look ☐ Nearly there ☐ Nailed it! ☐

Coordinates

You can use coordinates to describe the positions of points on a grid.



This point is to the left of O on the *x*-axis. So the *x*-coordinate is negative.

The vertical axis is labelled *y*.

The first number in a coordinate pair describes the horizontal position. The second number describes the vertical position.

The horizontal axis is labelled *x*.

The point *O* is called the origin and has coordinates (0, 0).

You can use negative numbers to describe points below O on the *y*-axis.

Worked example

Target grade 1

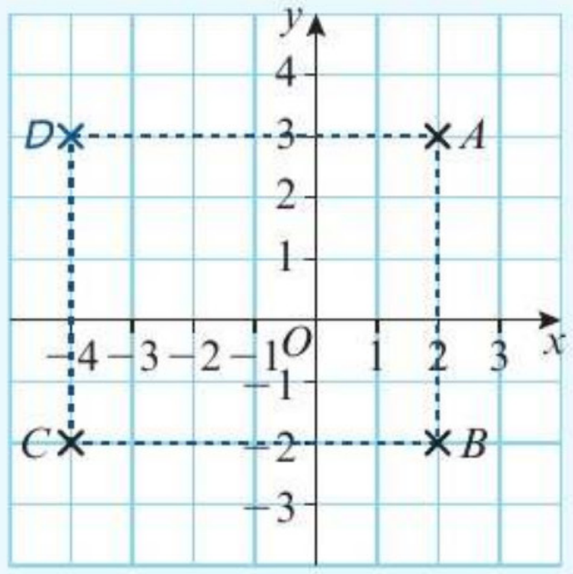
(a) Write down the coordinates
(i) of the point *A* **(1 mark)**

(2, 3)

(ii) of the point *B*. **(1 mark)**

(2, −2)

(b) On the grid, plot the point *D* so that *ABCD* is a rectangle. **(1 mark)**



Everything in blue is part of the answer.

A rectangle has four right angles. Plot point *D* level with point *A* and vertically above point *C*.

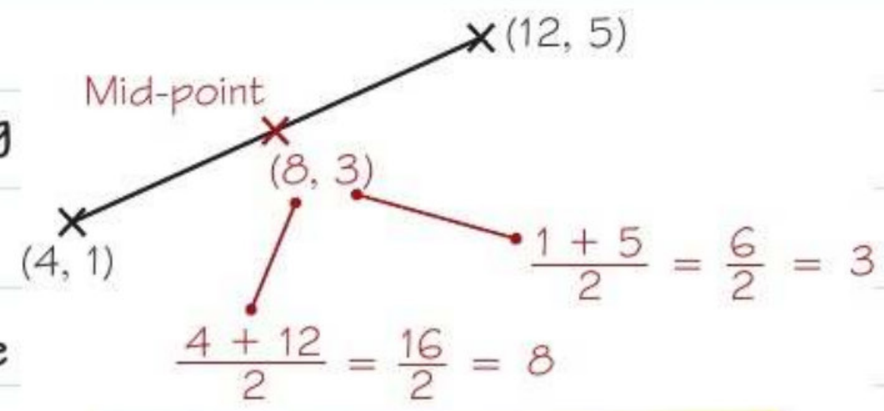
Mid-points

A **line segment** is a short section of a straight line.

The mid-point of a line segment is exactly halfway along the line. You can find the mid-point if you know the coordinates of the ends.

To find the mid-point, add the *x*-coordinates and divide by 2 and add the *y*-coordinates and divide by 2.

$$\text{Mid-point} = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$



You need to be confident in finding mid-points if you're aiming for a top grade.

Now try this

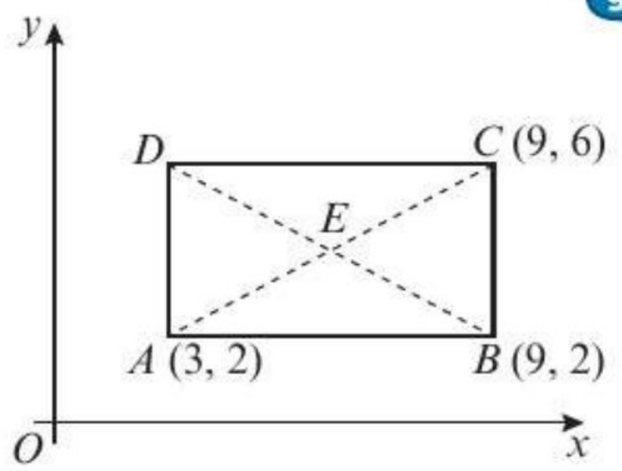
Target grade 3

ABCD is a rectangle.

(a) Work out the coordinates of *D*. **(1 mark)**

(b) Work out the length of *AB*. **(1 mark)**

(c) *E* is the centre of the rectangle.
Work out the coordinates of *E*. **(2 marks)**



E is the mid-point of *AC* and of *BD*.