

Dr Oliver Mathematics

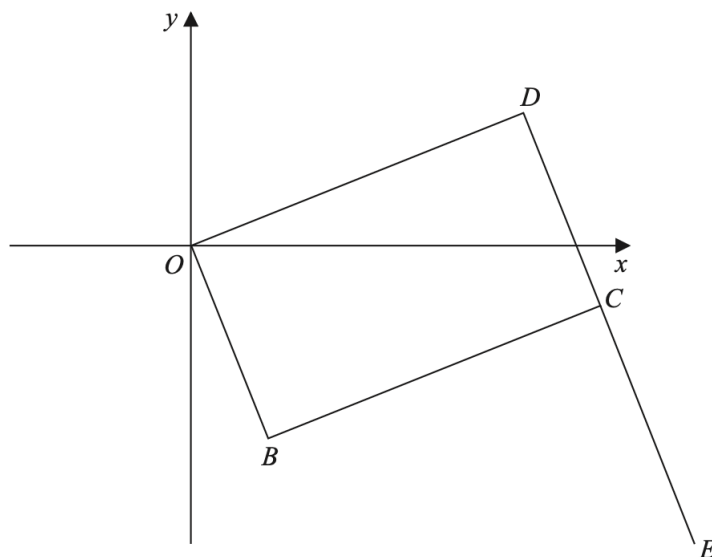
Worked Examples

Coordinate Geometry 1

From: Edexcel GCSE Mathematics November 2024 Paper 3 (Calculator)

1. $OBCD$ is a rectangle.
 DCE is a straight line.

(5)



- B has coordinates $(2, -4)$.
- E has coordinates $(12, -6.5)$.

Work out the coordinates of D .
You must show all your working.

Solution

Since the shape is a rectangle,

$$\begin{aligned} m_{DCE} &= m_{OB} \\ &= \frac{-4 - 0}{2 - 0} \\ &= -2, \end{aligned}$$

and the equation of the line going through D , C , and E is

$$y = -2x + c,$$

for some constant c .

Now,

$$\begin{aligned}x = 12, y = -6.5 &\Rightarrow -6.5 = -24 + c \\&\Rightarrow c = 17.5,\end{aligned}$$

and the equation of the line going through D , C , and E is

$$\boxed{y = -2x + 17.5 \quad (1).}$$

In addition,

$$m_{OD} = \frac{1}{2}$$

and the equation of the line going through O and D is

$$\boxed{y = \frac{1}{2}x \quad (2).}$$

Simultaneous equations:

$$\begin{aligned}-2x + 17.5 &= \frac{1}{2}x \Rightarrow -2.5x = -17.5 \\&\Rightarrow x = 7\end{aligned}$$

insert the value of x into (2):

$$\Rightarrow y = 3.5;$$

hence, $D(7, 3.5)$.

Check: $(-2) \times 7 + 17.5 = 3.5 \checkmark$