

1. The point A has coordinates $(-3, -2)$
 The point B has coordinates $(7, 5)$
 The straight line l_1 passes through A and B .

(a) Find the gradient of l_1 giving your answer in simplest form.

(2)

(b) Find an equation for l_1 giving your answer in the form $ax + by + c = 0$, where a , b and c are integers to be found.

(2)

Given that the line l_2 is perpendicular to l_1

(c) write down the gradient of l_2

(1)

(a) Gradient = $\frac{y_2 - y_1}{x_2 - x_1} = \frac{5 - (-2)}{7 - (-3)}$ (1 mark)

$= \frac{5+2}{7+3} = \frac{7}{10}$ (1 mark)

(b) Let Gradient be $m = \frac{7}{10}$

Equation of line is $\frac{y - y_1}{x - x_1} = m$

$\Rightarrow \frac{y - (-2)}{x - (-3)} = \frac{7}{10}$ (1 mark)

$\frac{y+2}{x+3} = \frac{7}{10} \Rightarrow 10(y+2) = 7(x+3)$

$10y + 20 = 7x + 21$

$0 = 7x + 21 - 10y - 20$

$\Rightarrow 7x - 10y + 1 = 0$ (1 mark)

(c) Perpendicular Gradient, $m_{\perp} = -\frac{1}{m}$

$= -\frac{1}{\left(\frac{7}{10}\right)}$

$= -\frac{10}{7}$ (1 mark)