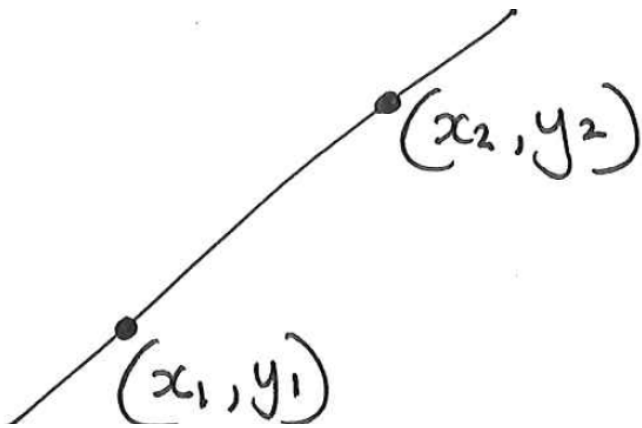


Year 1 Pure Chapter 5 - Straight Line Graphs

Straight Line Equation



$$y = mx + c$$

or

$$ax + by + c = 0$$

$$\text{Gradient} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$y - y_1 = m(x - x_1)$$

Parallel:

same gradients

$$y = 3x - 2$$

$$y = 3x + 4$$

Perpendicular:

negative reciprocal

$$y = -\frac{2}{3}x - 2$$

$$y = \frac{3}{2}x + 4$$

Length

$$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

If asked for the exact value, give your answer in surd form if necessary.

Example

Find the equation and length.

$$(2, 3)$$

$$(-3, 5)$$

$$\begin{aligned}\text{Gradient} &= \frac{5 - 3}{-3 - 2} \\ &= \frac{2}{-5}\end{aligned}$$

$$y - 3 = \frac{2}{-5}(x - 2)$$

$$-5y + 15 = 2x - 4$$

$$-5y = 2x - 19$$

$$y = -\frac{2}{5}x + \frac{19}{5}$$

$$\sqrt{(-3 - 2)^2 + (5 - 3)^2}$$

$$= \sqrt{(-5)^2 + (2)^2}$$

$$= \sqrt{21}$$