

Sketching Straight Lines

Using x & y intercepts C cannot be equal to 0	Gradient - intercept method
$ax + by = c \rightarrow$ e.g $2x - 5y = 10$	$y = mx + c$
$y = 0$ when solving x	Horizontal Line
$2x - 0 = 10$	gradient = 0
$x = 5$	$y = c$
$x = 0$ when solving y	Vertical Line
$2(0) - 5y = 10$	gradient = undefined
$-5y = 10$	$x = a$
$y = 10/-5$	$a \rightarrow$ x-intercept
$y = -2$	

Finding the equation of a straight line

Gradient + y-intercept	Gradient + a point	2 points	Distance between 2 points
Sub into equation	Sub into equation	1st find m	Sub into equation
$y = mx + c$	$y - y_1 = m(x - x_1)$	$m = \frac{y_2 - y_1}{x_2 - x_1}$	$AB = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
Example	Example	2nd sub into equation	Example
$c = 5 \mid m = -1$	$m = 2 \mid (2, -0.5)$	$y - y_1 = m(x - x_1)$	$A = (3, -5) \mid B = (-2, 1)$
$y = -1x + 5$	$y + 0.5 = 2(x - 2)$	Example	$AB = \sqrt{(-2 - 3)^2 + (1 - -5)^2}$
	$y + 0.5 = 2x - 4$	$(-1, 4), (5, 2)$	$AB = \sqrt{(-5)^2 + 6^2}$
	$y = 2x - 4.5$	$m = 2 - \frac{4}{3} = -\frac{1}{3}$	$AB = \sqrt{25 + 36}$
		$m = -\frac{2}{4} \rightarrow -\frac{1}{2}$	$AB = \sqrt{61}$
		$y - 4 = -\frac{1}{2}(x - -1)$	

Finding the equation of a straight line (cont)

$$y - 4 = -\frac{1}{2}x - \frac{1}{2}$$

$$y = -\frac{1}{2}x + \frac{7}{2}$$

Middle point of a line

Middle point of a line	Paralell Lines	Perpendicular Lines
Sub into equation - i.e / means divide	Sub into equation	Sub into equation
$M = (\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2})$	$m_1 = m_2$	$m_1 \times m_2 = -1$ or $m_2 = \frac{1}{m_1}$
Example	Example - 1st find m (gradient)	Example - 1st find m (gradient)
$(3, 5) \mid (2, 7)$	$A(4, 13) \mid B(2, 9)$	$A(-4, 9) \mid B(2, -6)$
$M = 3 + \frac{2}{2}, 5 + \frac{7}{2}$	$m_{AB} = 9 - \frac{13}{2} - 4$	$m_{AB} = -6 - \frac{9}{2} - (-4)$
$M = (\frac{5}{2}, \frac{12}{2})$	$m_{AB} = -\frac{4}{2}$	$m_{AB} = -\frac{15}{6}$
$M = (\frac{5}{2}, 6)$	$m_{AB} = 2$	$m_{AB} = -\frac{5}{2}$
	$C(0, -10) \mid D(15, 0)$	$C(-5, 8) \mid D(10, 14)$
	$m_{CD} = 0 - \frac{-10}{15} - 0$	$m_{CD} = 14 - \frac{8}{10} - (-5)$
	$m_{CD} = \frac{10}{15}$	$m_{CD} = \frac{6}{15}$
	$m_{CD} = \frac{2}{3}$	$m_{CD} = \frac{2}{5}$
	$\therefore m_{AB} \neq m_{CB}$	2nd sub into $m_1 \times m_2 = -1$
	$\therefore$ not parallel	$-\frac{5}{2} \times \frac{2}{5} = -1$
		$-\frac{10}{10} = -1$
		$\therefore AB \perp CD$

