

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 (x1, y1)	2 points (x1, y1) (x2, y2)	Distance between 2 points
Sub into equation	Sub into equation	1st find m	Sub into equation
$y = mx + c$	$y - y1 = m(x - x1)$	$m = \frac{y2 - y1}{x2 - x1}$	$AB = \sqrt{(x2 - x1)^2 + (y2 - y1)^2}$
Example	Example	2nd sub into equation	Example
$c = 5 \mid m = -1$	$m = 2 \mid (2, -0.5)$	$y - y1 = m(x - x1)$	$A = (3, -5) \mid B = (-2, 1)$
$y = -1x + 5$	$y + 0.5 = 2(x - 2)$	Example	$AB = \sqrt{(-2 - 3)^2 + (1 - -5)^2}$
	$y + 0.5 = 2x - 4$	$(-1, 4), (5, 2)$	$AB = \sqrt{(-5)^2 + 6^2}$
	$y = 2x - 4.5$	$m = 2 - \frac{4}{3} = -\frac{1}{3}$	$AB = \sqrt{25 + 36}$
		$m = -2/4 \rightarrow -1/2$	$AB = \sqrt{61}$
		$y - 4 = -1/2(x - -1)$	

Finding the equation of a straight line (cont)

$$y - 4 = -1/2x - 1/2$$

$$y = -1/2x + 7/2$$

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
$M = (x1 + x2/2, y1 + y2/2)$	$m1 = m2$	$m1 \times m2 = -1$ or $m2 = 1/m1$
Example	Example - 1st find m (gradient)	Example - 1st find m (gradient)
$(3, 5) \mid (2, 7)$	$A (4, 13) \mid B (2, 9)$	$A (-4, 9) \mid B (2, -6)$
$M = 3 + 2/2, 5 + 7/2$	$mAB = 9 - 13/2 - 4$	$mAB = -6 - 9/2 - (-4)$
$M = (5/2, 12/2)$	$mAB = -4/-2$	$mAB = -15/6$
$M = (5/2, 6)$	$mAB = 2$	$mAB = -5/2$
	$C (0, -10) \mid D (15, 0)$	$C (-5, 8) \mid D (10, 14)$
	$mCD = 0 - (-10)/15 - 0$	$mCD = 14 - 8/10 - (-5)$
	$mCD = 10/15$	$mCD = 6/15$
	$mCD = 2/3$	$mCD = 2/5$
	$\therefore mAB \neq mCB$	2nd sub into $m1 \times m2 = -1$
	$\therefore$ not parallel	$-5/2 \times 2/5 = -1$
		$-10/10 = -1$
		$\therefore AB \perp CD$