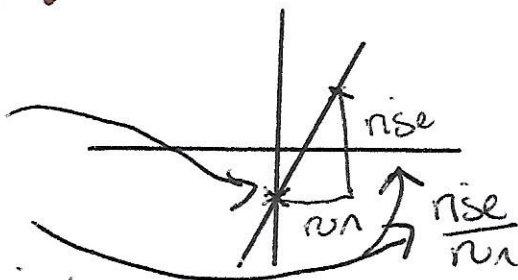


GRAPHS - straight line graphs

Equation of a straight line

$$y = mx + c \quad c = y \text{ intercept}$$

$m = \text{gradient}$ found by measuring
gradient can also be found from 2 coordinates



$$\Rightarrow \frac{\text{difference in } y \text{ coordinates}}{\text{difference in } x \text{ coordinates}}$$

Finding an equation from coordinates A(2,5) B(6,7)

① find gradient $\frac{7-5}{6-2} = \frac{2}{4} = \frac{1}{2}$

② start line equation $y = \frac{1}{2}x + c$

③ substitute one coordinate into eq to find x Using A (2,5)

$$5 = \frac{1}{2} \times 2 + c \quad 5 = 1 + c \quad c = 4$$

$$\Rightarrow y = \frac{1}{2}x + 4$$

Parallel gradients are always the same

ie $y = 3x + 4$
every line parallel to it
has gradient of 3

Perpendicular gradients if a line has a gradient m
A perpendicular line has the gradient $-\frac{1}{m}$

ie $y = 3x + 4$ a perpendicular line has the gradient $-\frac{1}{3}$

Finding midpoint of a line

Simply add the coordinates together & divide by 2

eg A(1,4) & B(3,8)

x coordinate $\frac{1+3}{2} = 2$

y coordinate $\frac{4+8}{2} = 6$

Midpoint = (2,6)

Finding coordinates from ratios

when a line is split into a ratio

ie Find B when A = (2,3) C = (8,12) & AB : BC

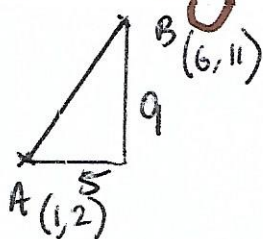
find difference in coordinates $x = \frac{6}{2:4}$ $y = \frac{9}{3:6}$
then split into ratio

B = (4,6)

Length of a line segment

found simply by using Pythagoras

If A = (1,2)
B = (6,11)



$$\text{length } AB = \sqrt{5^2 + 9^2} = 12.1$$