

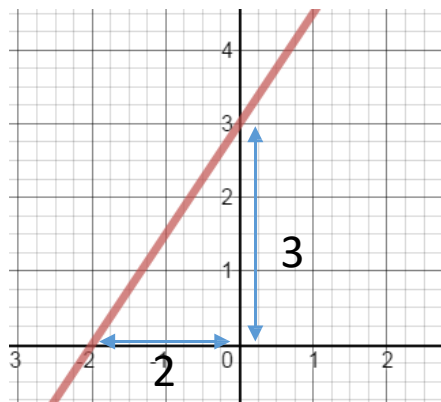


32 - Linear Graphs – Equation of a line

Gradient

Gradient or **m** is a measure of the steepness of a line. The higher the value of **m**, the steeper the line.

Gradient from a graph



$$m = \frac{\text{change in } y}{\text{change in } x}$$

$$m = \frac{3}{2}$$

$$y = mx + c$$

← y-coordinate ← intercept
 ↗ ↘
 gradient x-coordinate

Intercept

The **intercept** or **c** is the y-value where the line crosses the y-axis.

Gradient from two points

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

Example:

Find the gradient of the line segment between (2, -3) and (6, 9).

$$\frac{9 - (-3)}{6 - 2}$$

So the gradient of this line segment is 3.

Parallel and Perpendicular

Two lines are **parallel** if they have the same gradient.

Example:

Give the equation of a line which is parallel to $y = 5x + 1$.

The answer to this is any line with equation $y = 5x + a$, where a is any number apart from $+1$, for example $y = 5x + 4$, $y = 5x - 2$, $y = 5x + 100$

Two lines are **perpendicular** if their gradients have a product of -1 .

Example:

The answer to this would be any line with a gradient of -2 as $-2 \times \frac{1}{2} = -1$, for example $y = -2x - 2$, $y = -2x + 22$

Linked Prior Topics

Coordinates, plotting, substitution, parallel and perpendicular

Vocabulary

Gradient, intercept, parallel, perpendicular

Linked Future Topics

Solving equations, real-life graphs