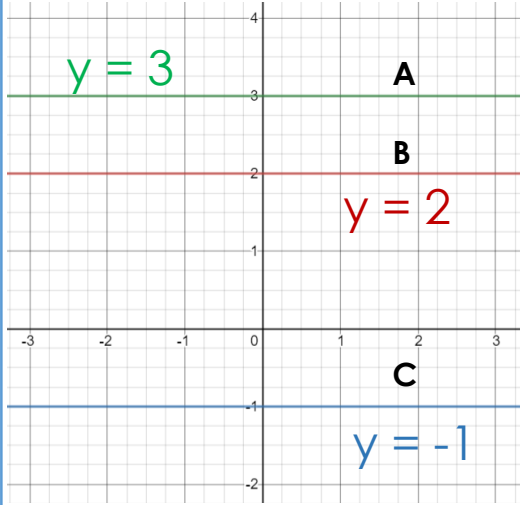


Y8 Mastery: Unit 4 – Linear Graphs

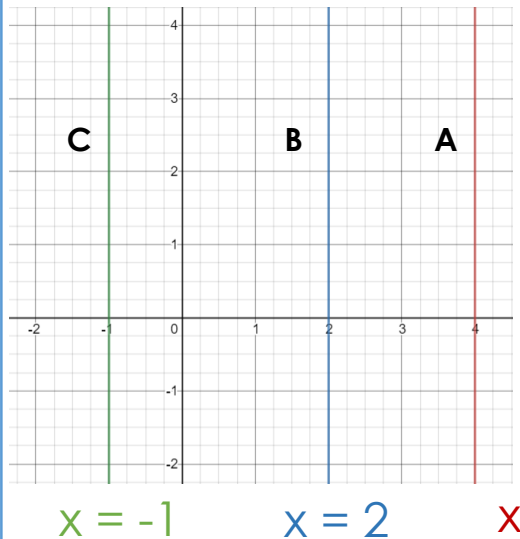
Before starting work with linear graphs, you may find it useful to look back at the **Y7 Mastery Unit 10 – Coordinates** knowledge organiser

Horizontal & Vertical Lines



Horizontal line example:

Looking at the coordinates for line A (-2,3) (-1,3) (0,3) (1,3) (2,3)
Every y-coordinate equals 3! Therefore the equation of line A is $y = 3$

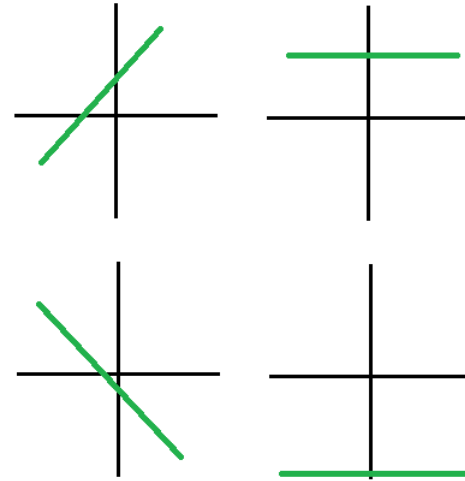


Vertical line example:

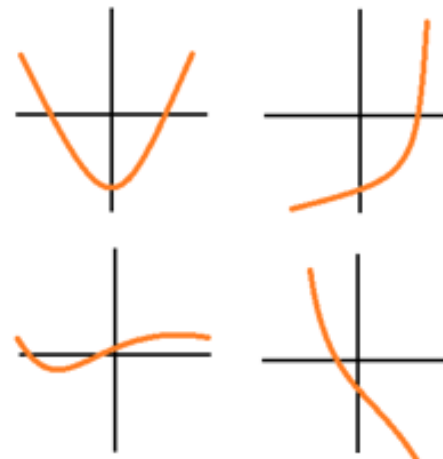
Looking at the coordinates for line A (4,-1) (4,0) (4,1) (4,2) (4,3)
Every x-coordinate equals 4! Therefore the equation of line A is $x = 4$

Linear & Non-Linear Graphs

Linear Graphs



Non-Linear Graphs



Keyword/Skill	Definition/Tips
Coordinate	Written in pairs as (x, y). The first term is the x-coordinate (movement left or right). The second term is the y-coordinate (movement up or down)
Axis/Axes	The lines that make up a graph. The y axis is the vertical line. The x axis is the horizontal line.
X-coordinate	This is the first term written in a coordinate, it represents where the coordinate is on the x axis (x, y)
Y-coordinate	This is the second term written in a coordinate, it represents where the coordinate is on the y axis (x, y)
Linear Graph	A group of coordinates that form a straight line
Origin	The very middle of a graph, the coordinate of (0,0)
Region	The area of a graph that satisfies an inequality
Gradient	How steep a line is
Y-Intercept	The point where a line or a curve crosses the y-axis of a graph
Satisfy	A value (or values) that solve an equation or fits an inequality
Plane	A flat, two-dimensional surface
Horizontal	Going from side to side
Vertical	Going in an up-down direction

Other Topics/Units this could appear in:

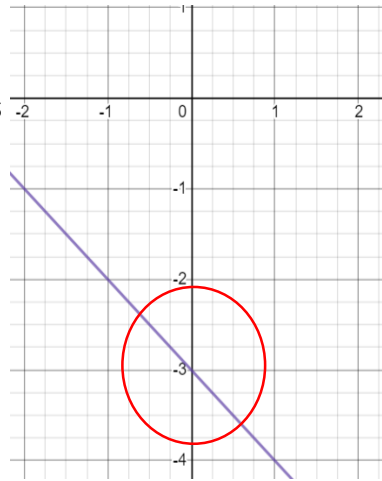
- Straight-line Graphs
- Transformations
- Similarity and Congruence in 2D
- Coordinate Geometry

Y8 Mastery: Unit 4 – Linear Graphs

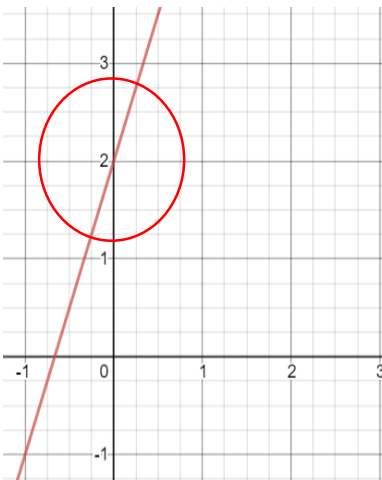
The Y-Intercept

The y-intercept is where the graph crosses the y-axis.
The x-coordinate where a graph crosses the y-axis is always 0.

The graph here crosses the y-axis at -3. The coordinate would be (0,-3)
That means the **y-intercept is -3.**

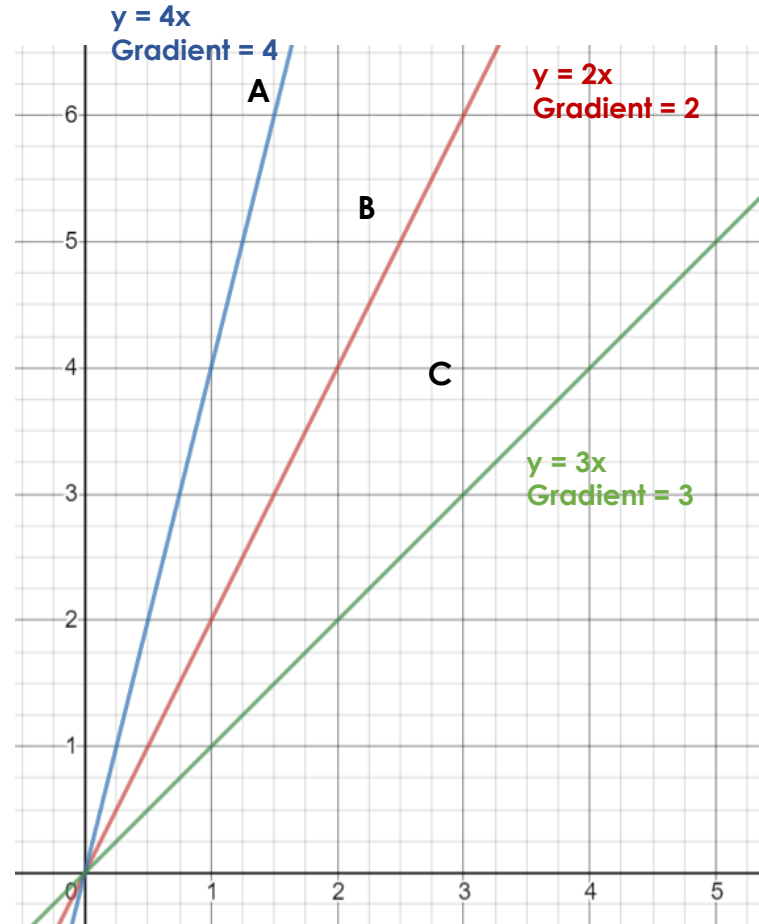


The graph here crosses the y-axis at 2. The coordinate would be (0,2)
That means the **y-intercept is 2.**



Gradient of a Line

The gradient is the rate of change of y with respect to x.
It tells us how much y increases or decreases when x is increased by 1



Line A represents the relationship $y = 4x$
When x increases by **1**, y increases by **4**. That means the gradient of Line A is **4**.

Keyword/Skill	Definition/Tips
Coordinate	Written in pairs as (x, y). The first term is the x-coordinate (movement left or right). The second term is the y-coordinate (movement up or down)
Axis/Axes	The lines that make up a graph. The y axis is the vertical line. The x axis is the horizontal line.
X-coordinate	This is the first term written in a coordinate, it represents where the coordinate is on the x axis (x , y)
Y-coordinate	This is the second term written in a coordinate, it represents where the coordinate is on the y axis (x, y)
Linear Graph	A group of coordinates that form a straight line
Origin	The very middle of a graph, the coordinate of (0,0)
Region	The area of a graph that satisfies an inequality
Gradient	How steep a line is
Y-Intercept	The point where a line or a curve crosses the y-axis of a graph
Satisfy	A value (or values) that solve an equation or fits an inequality
Plane	A flat, two-dimensional surface
Horizontal	Going from side to side
Vertical	Going in an up-down direction

Other Topics/Units this could appear in:

- Straight-line Graphs
- Transformations
- Similarity and Congruence in 2D
- Coordinate Geometry

Y8 Mastery: Unit 4 – Linear Graphs

Finding the Equation of the Graph/Line

We can find the equation of the graph by looking for the gradient and the y-intercept of the line.

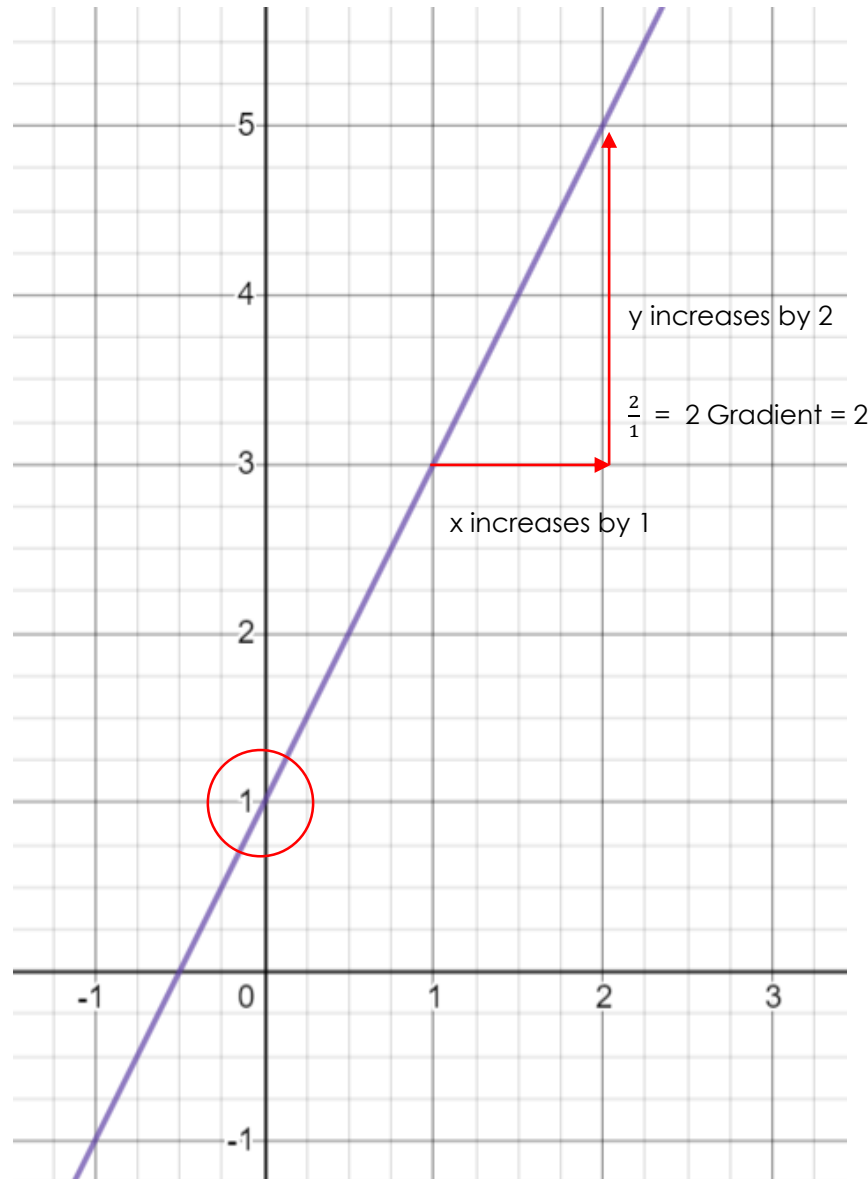
When x increases by 1, y increases by 2. That means the gradient of the line is 2.
Looking where the graph crosses the y-axis (when the x-coordinate equals 0) then we can see the y-intercept is 1.

We can represent this as:

$$y = 2x + 1$$

↖ Gradient = +2 ↗ Y intercept = +1

What this equation means, is you take the x-coordinate and multiply it by 2 (the gradient) then add 1 to get the y-coordinate.
E.g. $x = 1$ $(2 \times 1) + 1 = 3$ $y = 3$ $(1, 3)$



Keyword/Skill	Definition/Tips
Coordinate	Written in pairs as (x, y). The first term is the x-coordinate (movement left or right). The second term is the y-coordinate (movement up or down)
Axis/Axes	The lines that make up a graph. The y axis is the vertical line. The x axis is the horizontal line.
X-coordinate	This is the first term written in a coordinate, it represents where the coordinate is on the x axis (x , y)
Y-coordinate	This is the second term written in a coordinate, it represents where the coordinate is on the y axis (x, y)
Linear Graph	A group of coordinates that form a straight line
Origin	The very middle of a graph, the coordinate of (0,0)
Region	The area of a graph that satisfies an inequality
Gradient	How steep a line is
Y-Intercept	The point where a line or a curve crosses the y-axis of a graph
Satisfy	A value (or values) that solve an equation or fits an inequality
Plane	A flat, two-dimensional surface
Horizontal	Going from side to side
Vertical	Going in an up-down direction

Other Topics/Units this could appear in:

- Straight-line Graphs
- Transformations
- Similarity and Congruence in 2D
- Coordinate Geometry