

Straight Lines - Lesson 4

Straight Line Equations
(Using $y - b = m (x - a)$)

LI

- Find the equation of a straight line in the form $y = m x + c$.

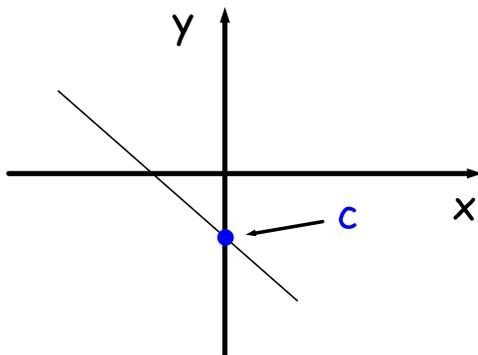
SC

- Substitution.
- Rearrangement.

The Equation of a Straight Line is :

$$y = m x + c$$

gradient \swarrow \nwarrow y - intercept



c is where the line crosses the y - axis

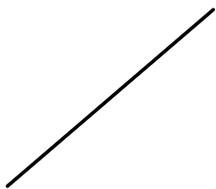
Types of Line Equations



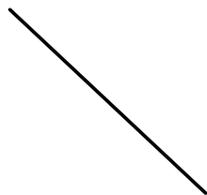
$$y = \text{number}$$



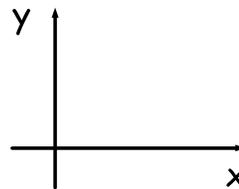
$$x = \text{number}$$



or



$$y = mx + c$$



Example 1

Find the equation of the straight line with gradient 3 and passing through the point (4, 5).

$$m = 3$$

$$\begin{array}{l} (4, 5) \\ a \quad b \end{array}$$

$$y - b = m (x - a)$$

$$y - 5 = 3 (x - 4)$$

$$y - 5 = 3x - 12$$

$$y = 3x - 7$$

Example 2

Find the equation of the straight line with gradient $1/2$ and passing through the point $(-6, 3)$.

$$m = 1/2$$

$$\begin{array}{c} (-6, 3) \\ a \quad b \end{array}$$

$$y - b = m(x - a)$$

$$y - 3 = 1/2(x - (-6))$$

$$y - 3 = 1/2(x + 6)$$

$$y - 3 = 1/2x + 3$$

$$y = 1/2x + 6$$

Example 3

Find the equation of the straight line with gradient 0 and passing through the point (7, 15).

$$m = 0$$

$$(7, 15)$$

a b

$$y - b = m (x - a)$$

$$y - 15 = 0 (x - 7)$$

$$y - 15 = 0$$

$$y = 15$$

Find the equations of the straight lines with gradient and point :

1) $m = 2, (3, 4)$

2) $m = -1, (3, 5)$

3) $m = 10, (-1, 4)$

4) $m = -3, (7, 11)$

5) $m = 8, (8, 8)$

6) $m = 0, (2, 3)$

7) $m = 10, (-20, -40)$

8) $m = 1/2, (4, 3)$

9) $m = 1/3, (9, -2)$

10) $m = 3/4, (-16, 0)$

11) $m = 7, (2, 14)$

12) $m = -3, (3, -9)$

13) $m = 1/5, (1, 3/5)$

14) $m = 7/11, (2, 3)$

15) $m = -3/16, (4, -3/4)$

16) $m = -51, (1/17, -8)$

Find the equations of the straight lines with gradient and point :

$$1) m = 2, (3, 4) \quad y = 2x - 2$$

$$2) m = -1, (3, 5) \quad y = -x + 8$$

$$3) m = 10, (-1, 4) \quad y = 10x + 14$$

$$4) m = -3, (7, 11) \quad y = -3x + 32$$

$$5) m = 8, (8, 8) \quad y = 8x - 56$$

$$6) m = 0, (2, 3) \quad y = 3$$

$$7) m = 10, (-20, -40) \quad y = 10x + 160$$

$$8) m = 1/2, (4, 3) \quad y = 1/2x + 1$$

$$9) m = 1/3, (9, -2) \quad y = 1/3x - 5$$

$$10) m = 3/4, (-16, 0) \quad y = 3/4x + 12$$

$$11) m = 7, (2, 14) \quad y = 7x$$

$$12) m = -3, (3, -9) \quad y = -3x$$

$$13) m = 1/5, (1, 3/5) \quad y = 1/5x + 2/5$$

$$14) m = 7/11, (2, 3) \quad y = 7/11x + 19/11$$

$$15) m = -3/16, (4, -3/4) \quad y = -3/16x$$

$$16) m = -51, (1/17, -8) \quad y = -51x - 5$$