Straight Lines - Lesson 1

Straight Line Equations (Given Coordinate and Gradient)

LI

- Know the important features of a straight line equation.
- Find the equation of a straight line.

SC

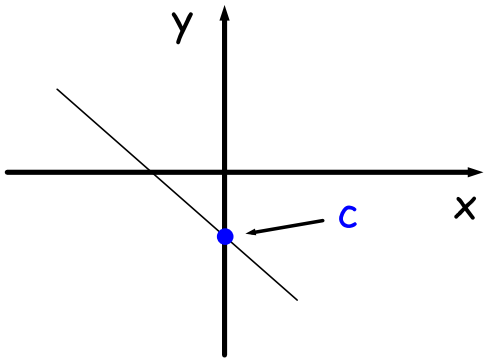
- Find y - intercept.
- Substitution.

The Equation of a Straight Line is :

$$y = mx + c$$

gradient

y - intercept



c is where the line crosses the y - axis

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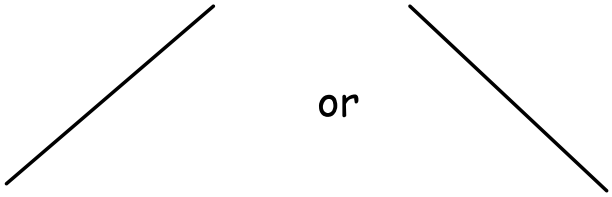
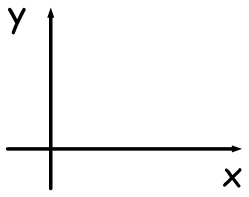
Types of Line Equations

$y = \text{number}$

$x = \text{number}$



$y = mx + c$



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Example 1

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

$m = 3$

$(4, 5)$
$x \quad y$

$y = mx + c$

$5 = 3(4) + c$

$5 = 12 + c$

$c = -7$

$\therefore \quad y = 3x - 7$

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Example 2

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

$m = 1/2$

$(-6, 3)$
$x \quad y$

$y = mx + c$

$3 = 1/2\,(-6) + c$

$3 = -3 + c$

$c = 6$

$\therefore \quad y = \frac{1}{2}x + 6$

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Example 3

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

$m = 0$

$(7, 15)$
$x \quad y$

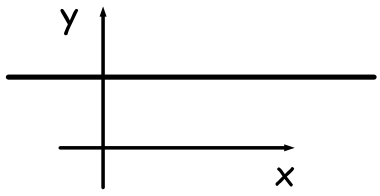
$y = mx + c$

$15 = 0(7) + c$

$15 = 0 + c$

$c = 15$

$\therefore \quad \boxed{y = 15}$

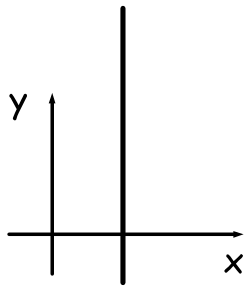


Example 4

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

$m = \infty$

(7, 15)
x y



$x = 7$

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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) $m = \infty, (-6, 1)$

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

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

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

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

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

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

7) $m = \infty,\ (-6, 1)$ $x = -6$

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

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

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

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

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

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

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

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

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

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