

Linear Equations

Example

Find the equation of the line passing through the points (2, 3) and (-2, -5)

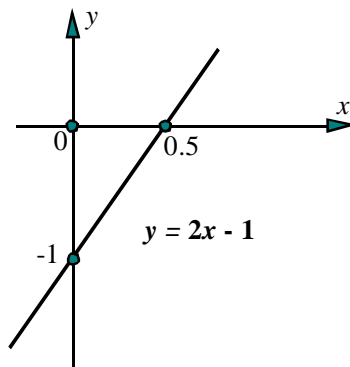
The useful form here of the standard equation of a straight line is: $y - y_1 = m(x - x_1)$

At (2, 3): $y - 3 = m(x - 2)$ and the gradient of the line is: $m = \frac{y_1 - y_2}{x_1 - x_2} = \frac{3 - (-5)}{2 - (-2)} = \frac{8}{4} = 2$

So the equation of the line is: $y - 3 = 2(x - 2) \therefore y = 2x - 1$

Also, observe the following: when $x = 0$ $y = -1$, when $y = 0$ $x = \frac{1}{2}$, gradient (m) > 1

These observations will enable us to draw a sketch graph of the line:



Exercises

Find equations for the straight lines that pass through the given point with given gradient and sketch their graphs:

- 1 (-2,5), $m = \frac{1}{2}$ 2 (3,-2), $m = -\frac{4}{5}$ 3 (3,6), $m = -7$ 4 $(1, -\frac{1}{2})$, $m = 3$

Find equations for the straight lines that pass through the given pairs of points and sketch their graphs:

- 5 (2,1) and (5,3) 6 (3,7) and (2,4) 7 (-2,3) and (3,-2) 8 (-1,4) and (2,3)

Answers

1. $y = \frac{1}{2}x + 6$ 2. $y = -\frac{5}{4}x + \frac{5}{2}$ 3. $y = -7x + 27$ 4. $y = 3x - \frac{7}{2}$ 5. $y = \frac{3}{2}x - \frac{5}{2}$ 6. $y = 3x - 2$ 7. $y = -x + 1$ 8. $y = -\frac{1}{11}x + \frac{3}{11}$