The equation of a line through two points

ANSWERS

1

Find the gradient of the line through (1, 5) and (3, 11).

$m = \frac{11-5}{3-1}$

$= \frac{6}{2} = 3$

Gradient 3

2

Find the gradient of the line through (2, 3) and (6, 11).

$m = \frac{11-3}{6-2}$

$= \frac{8}{4} = 2$

Gradient 2

3 *Notice the change!*

Find the gradient of the line through (1, 9) and (4, 3).

$m = \frac{3-9}{4-1}$

$= \frac{-6}{3} = -2$

Gradient −2

4

Find the equation of the line through (1, 4) and (3, 10).

$m = \frac{10-4}{3-1} = \frac{6}{2} = 3$

$4 = 3 \times 1 + c$

$c = 1$

Answer $y = 3x + 1$

5

Find the equation of the line through (2, 7) and (4, 15).

$m = \frac{15-7}{4-2} = \frac{8}{2} = 4$

$7 = 4 \times 2 + c$

$c = -1$

Answer $y = 4x - 1$

6

Find the equation of the line through (2, 3) and (5, 12).

$m = \frac{12-3}{5-2} = \frac{9}{3} = 3$

$3 = 3 \times 2 + c$

$c = -3$

Answer $y = 3x - 3$

7 *Notice the change!*

Find the equation of the line through (1, 8) and (3, 2).

$m = \frac{2-8}{3-1} = \frac{-6}{2} = -3$

$8 = -3 \times 1 + c$

$c = 11$

Answer $y = -3x + 11$

8

Leo says the gradient of the line through (2, 1) and (6, 9) is $\frac{1}{2}$. Explain his mistake and find the equation of the line.

change in x over change in y

$m = \frac{9-1}{6-2} = \frac{8}{4} = 2$

$1 = 4 + c, \; c = -3$

Answer $y = 2x - 3$

The equation of a line through two points *further practice*

ANSWERS

9

Find the equation of the line through (2, 7) and (5, 1).

$m = \frac{1-7}{5-2} = \frac{-6}{3} = -2$

$7 = -4 + c, \; c = 11$

Answer $y = -2x + 11$

10

Find the equation of the line through (0, 5) and (3, 11).

$m = \frac{11-5}{3-0} = \frac{6}{3} = 2$

(0, 5) is on the y axis: $c = 5$

Answer $y = 2x + 5$

11

Find the equation of the line through (2, 3) and (6, 5).

$m = \frac{5-3}{6-2} = \frac{2}{4} = \frac{1}{2}$

$3 = 1 + c, \; c = 2$

Answer $y = \frac{1}{2}x + 2$

12

Find the equation of the line through (−1, −4) and (2, 5).

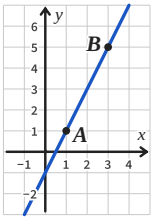
$m = \frac{5-(-4)}{2-(-1)} = \frac{9}{3} = 3$

$5 = 6 + c, \; c = -1$

Answer $y = 3x - 1$

13

Find the equation of the line through A and B.



A (1, 1), B (3, 5): $m = 4 \div 2 = 2$

$1 = 2 + c, \; c = -1$

Answer $y = 2x - 1$

14

A candle burns down at a steady rate.
After 2 hours it is 16 cm tall.
After 5 hours it is 10 cm tall.
How tall was the candle before it was lit?

$m = -6 \div 3 = -2$

$16 = -2 \times 2 + c, \; c = 20$

Answer 20 cm

15

A line passes through (1, −2) and (4, 4). Where does it cross the x axis?

$y = 2x - 4$

$0 = 2x - 4$, so $x = 2$

Answer (2, 0)

16

Do the points (0, 1), (2, 7) and (5, 15) lie on one straight line?
Show how you know.

through the first two: $y = 3x + 1$

$3 \times 5 + 1 = 16$, not 15

Answer No