

Given two points on a line, find an equation for the line.

Determine an equation for the line containing the points (9,2) and (15,6).

1) Find the slope of the line.

Δx	x	y	Δy	$\Delta y / \Delta x$
	9	2		
6	15	6	4	$2/3$

So, the line's slope is $2/3$.

2) An equation for the line may take the form $y = mx + b$ where "m" gives the line's slope and "b" gives the intercept on the vertical axis. Since the slope of the line through (9,2) and (15,6) is $2/3$, we seek a value for "b" so that the coordinates of those points will satisfy the resulting equation.

So, in the following equation we will choose a value for "b" so the equation is true when $x = 9$ and $y = 2$.

$$y = (2/3)x + b$$

Replacing the "x" with "9" and "y" with "2" we obtain

$$2 = (2/3)(9) + b.$$

Solving for b we obtain $b = -4$.

Hence, an equation for the line through (9,2) and (15, 6) is

$$y = (2/3)x - 4.$$

3) Check: Let's verify that the coordinates of the other point (15,6) satisfy the equation.

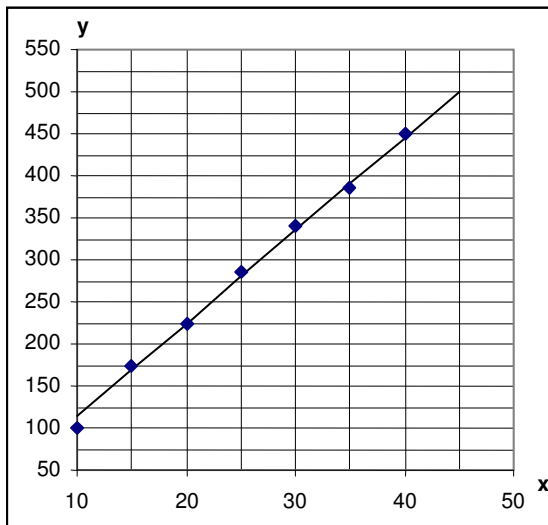
$$\begin{aligned} 6 &= (2/3)(15) - 4 \\ &= 10 - 4 = 6 \text{ (checks)} \end{aligned}$$

Practice Exercise: Find an equation for the line through the points (20, 4) and (80, 34).

Find an equation for a line that fits the data points below reasonably well.

x	y
10	100
15	175
20	225
25	285
30	340
35	385
40	450

- 1) Plot the data and sketch in a line that seems to fit the data reasonably well.



- 2) Find an equation for the line.

We locate two points on the line. In this case it looks like (20,225) and (45,500) are points on the line.

We now find our equation by the method on the previous page.

Practice Exercise: Find an equation for a line that fits the data below reasonably well.

x	y
20	20
25	34
30	34
35	42
40	38
45	45

