

# Key

What if you  
are given  
two points?

To write a linear equation given two points,  
( $x_1, y_1$ ) and ( $x_2, y_2$ ), follow this process:

Use the Slope Formula

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$



Use the Point-Slope Formula

$$y - y_1 = m(x - x_1)$$

## EXAMPLES!

Find the equation of  
the line given  
the two points.

7. (-3, 7) and (1, -1)

$$\frac{-1 - 7}{1 - (-3)} = \frac{-8}{4} = -2$$

$$y - 7 = -2(x + 3)$$

$$y - 7 = -2x - 6$$

$$y = -2x + 1$$

8. (-6, -7) and (3, -4)

$$\frac{-4 - (-7)}{3 - (-6)} = \frac{3}{9} = \frac{1}{3}$$

$$y + 7 = \frac{1}{3}(x + 6)$$

$$y + 7 = \frac{1}{3}x + 2$$

$$y = \frac{1}{3}x - 5$$

9. (2, -1) and (4, -6)

$$\frac{-6 - (-1)}{4 - 2} = \frac{-5}{2}$$

$$y + 1 = -\frac{5}{2}(x - 2)$$

$$y + 1 = -\frac{5}{2}x + 5$$

$$y = -\frac{5}{2}x + 4$$

10. (-3, -8) and (2, 7)

$$\frac{7 - (-8)}{2 - (-3)} = \frac{15}{5} = 3$$

$$y + 8 = 3(x + 3)$$

$$y + 8 = 3x + 9$$

$$y = 3x + 1$$

11. (-6, -3) and (-4, -1)

$$\frac{-1 - (-3)}{-4 - (-6)} = \frac{2}{2} = 1$$

$$y + 3 = 1(x + 6)$$

$$y + 3 = x + 6$$

$$y = x + 3$$

12. (-4, 7) and (6, 2)

$$\frac{2 - 7}{6 - (-4)} = \frac{-5}{10} = -\frac{1}{2}$$

$$y - 7 = -\frac{1}{2}(x + 4)$$

$$y - 7 = -\frac{1}{2}x - 2$$

$$y = -\frac{1}{2}x + 5$$