

## Equation of a line given slope and 1 point

ex. |  $m = -3$  (15, -50)

Slope

$$m = -3$$

y-intercept

$$y = mx + b$$

$$(-50) = -3(15) + b$$

$$-50 = -45 + b$$

$$+45 \quad +45$$

$$\boxed{-5 = b}$$

Equation

$$y = -3x - 5$$

substitute  
slope,  $x_1$  and  $y_1$

substitute  
slope +  
y-intercept

## Find the equation from 2 points!

ex. | 2 points: (29, 97) (14, 52)  
 $x_1 \quad y_1 \quad x_2 \quad y_2$

Slope (m)

$$\frac{\Delta y}{\Delta x} = \frac{y_1 - y_2}{x_1 - x_2}$$

$$m = \frac{97 - 52}{29 - 14} = \frac{45}{15}$$

$$\boxed{m = 3}$$

y-intercept (b)

$$y = mx + b$$

$$(52) = 3(14) + b$$

$$52 = 42 + b$$

$$-42 \quad -42$$

$$\boxed{10 = b}$$

Equation:

$$y = 3x + 10$$

use the other point  
to check!

$$\begin{aligned} y &= 3x + 10 \\ (97) &= 3(29) + 10 \\ 97 &= 87 + 10 \\ 97 &= 97 \checkmark \end{aligned}$$

# Standard Form: $ax + by = c$

Finding the intercepts using zero substitution

ex.1  $2x + 3y = 6$

Find y intercept  $(0, y)$

Find x-intercept  $(x, 0)$

$$2(0) + 3y = 6$$

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

$$\boxed{y = 2} \quad (0, 2)$$

$$2x + 3(0) = 6$$

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

$$\boxed{x = 3}$$

$$(3, 0)$$

