

## Finding the Equation of a Line Given the Slope and a Point

Recall:  $y = ax + b$    
 ← y-intercept   
 ↑ slope

Example: Find the equation of a line with a slope of 2 passing through the point (2,3).   
 $\tilde{\curvearrowright} a$    
 $\begin{matrix} x & y \\ (2,3) \end{matrix}$

Solution:

1. Write  $y = ax + b$
2. Substitute "a"
3. Plug in the point given to solve for "b"
4. Write equation

$$\textcircled{1} y = ax + b$$

$$a = 2 \quad P(2,3)$$

$$\textcircled{2} y = 2x + b$$

$$\textcircled{3} 3 = 2(2) + b$$

$$3 = 4 + b$$

$$-1 = b$$

$$\textcircled{4} y = 2x - 1$$

Examples:

Find the equations of the following:

a)  $a = -2$      $A(4, 2)$  \*     $y = -2x + 10$

b)  $a = 1/2$      $B(-4, 6)$  \*     $y = \frac{1}{2}x + 8$

c)  $a = 5$      $C(-1, 8)$

d)  $a = 1/4$      $D(-8, 10)$

e)  $a = -1$      $E(-1, -4)$