Name Key Period _____

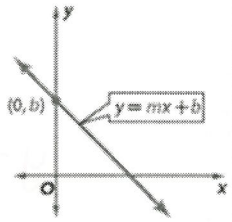
Chapter 4.1 Notes (Graphing Equations in Slope-Intercept Form)

Objectives:

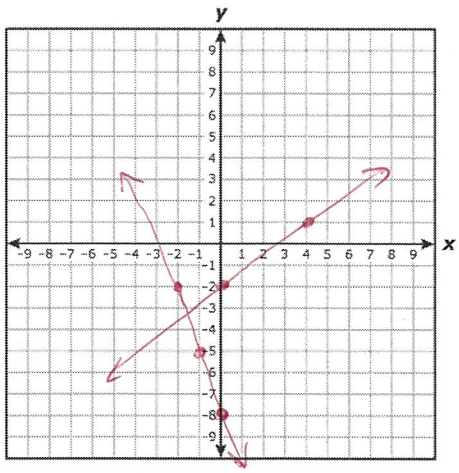
- Write linear equations in slope-intercept form.
- Graph linear equations in slope-intercept form.
- Model real-world data with equations in slope-intercept form.

Slope-Intercept Form: $y = mx + b$

Words	The slope-intercept form of a linear equation is $y = mx + b$, where m is the slope and b is the y-intercept.
Example	$y = mx + b$ $y = 2x + 6$ slope ↑ ↑ y-intercept



- Practice: Write an equation of a line in slope-intercept form with the given slope and y-intercept. Then, graph the equation.



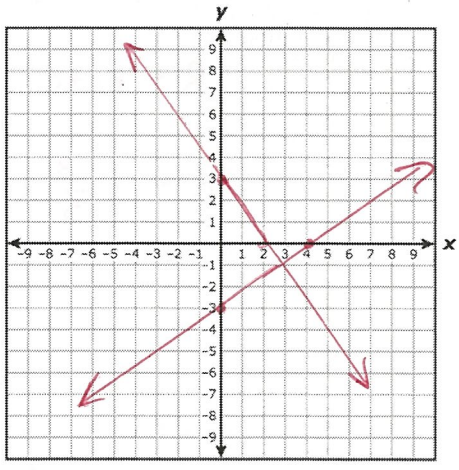
1. Slope $= \frac{3}{4}$; y − intercept $= -2$

$y = \frac{3}{4}x - 2$

2. Slope $= -3$; y − intercept $= -8$

$y = -3x - 8$

- Practice: Convert each equation into slope-intercept form. Then, graph the equation.



3. $3x + 2y = 6$

$-3x \quad -3x$

$2y = -3x + 6$

$y = -\frac{3}{2}x + 3$

4. $3x - 4y = 12$

$-3x \quad -3x$

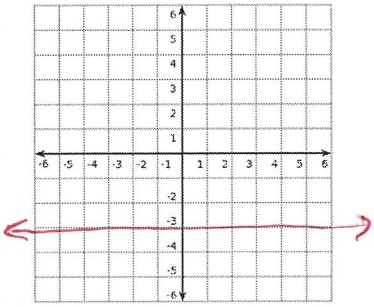
$\frac{-4y}{-4} = \frac{-3x + 12}{-4}$

$y = \frac{3}{4}x - 3$

Name _____ Period _____

Constant Functions: $y = b$

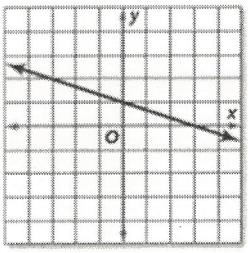
- This is a horizontal line with a slope of zero.
- Note: Before simplifying this would be written as $y = 0x + b$.



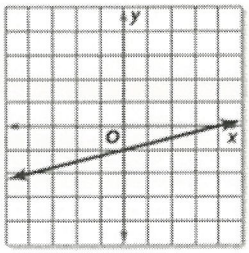
- Practice: Graph $y = -3$.

Find Slope-Intercept Form from a Graph

- Practice: Write an equation in slope-intercept form for each graph shown.



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



$y = \frac{1}{4}x - 1$

Application: Real-world data can be modeled by a linear equation in slope-intercept form.

- Example 1: The band boosters are selling sandwiches for \$5 each. They bought \$1160 in ingredients.

  a) Write an equation (in slope-intercept form) for the profit P made on n sandwiches.

  $P = 5n - 1160$

  b) Find the total profit if 1400 sandwiches are sold.

  $P = 5(1400) - 1160 = \$5840$

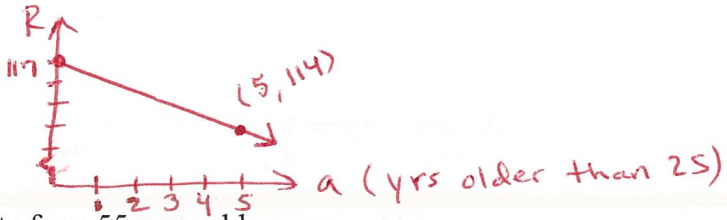
- Example 2: The ideal maximum heart rate for a 25-year-old exercising is 117 beats per minute. For every 5 years older than 25, that ideal rate drops 3 beats per minute.

  R = rate ; a = age (in years over 25)

  a) Write an equation (in slope-intercept form) to find the ideal maximum heart rate.

  $R = -\frac{3}{5}a + 117$

  b) Sketch a graph of the equation.



  c) Find the ideal maximum heart rate for a 55-year-old person.

  $R = -\frac{3}{5}(30) + 117 =$ 99 beats per minute