NAME:_____ Math _____ , Period _____

Mr. Rogove Date:_____

Learning Objective: We will use similar triangles to create the slope-intercept form of a line and transform the standard form of linear equations to the slope intercept form of linear equations. (G8M4L16)

Activating Prior Knowledge:

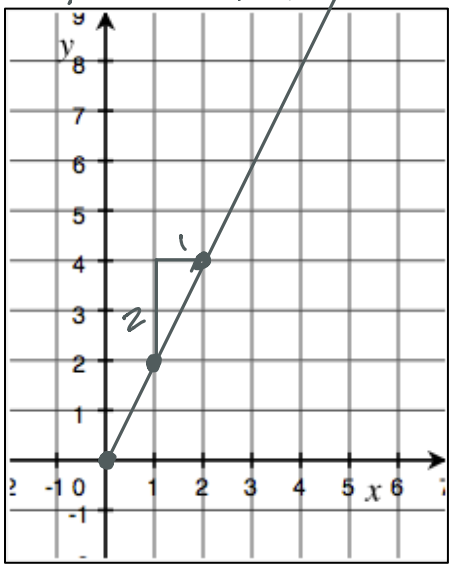
We can draw graphs of linear equations.

Find 3 solutions to the equation $y = 2x$ and graph the solutions. Draw a line and find the slope of the line.

Point 1: $y = 2(0)$ $y = 0$ $(0, 0)$

Point 2: $y = 2(1)$ $y = 2$ $(1, 2)$

Point 3: $y = 2(2)$ $y = 4$ $(2, 4)$



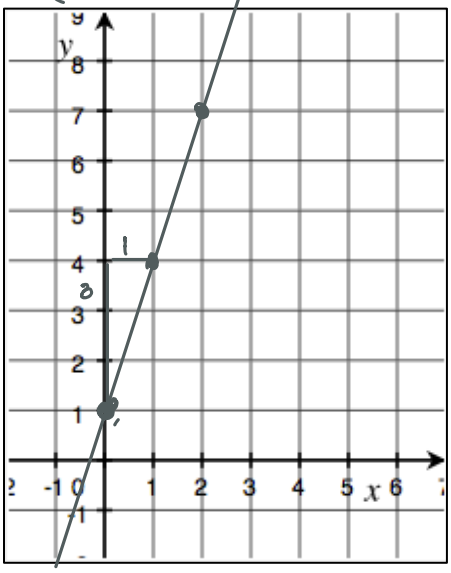
Slope: $m = 2$

Find 3 solutions to the equation $y = 3x + 1$ and graph the solutions. Draw a line and find the slope of the line.

Point 1: $(0, 1)$

Point 2: $(1, 4)$

Point 3: $(2, 7)$

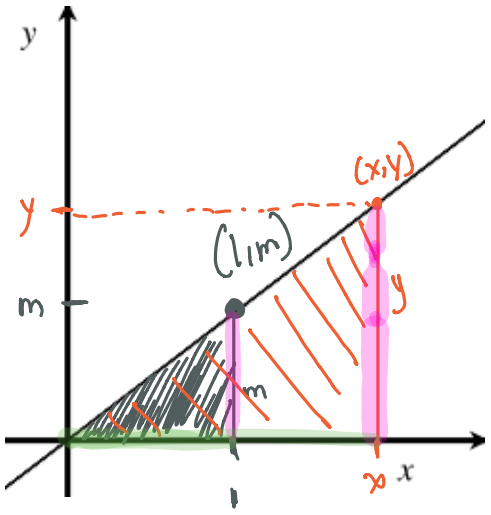
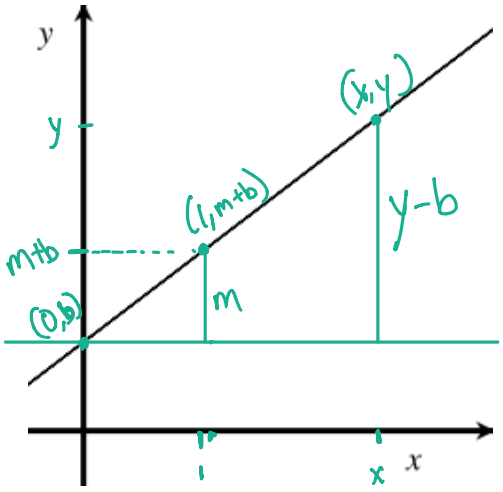


Slope: $m = 3$

NAME:_____ Math _____ , Period _____

Mr. Rogove Date:_____

Concept Development:

Prove that the graph of the line $y = mx$ has the slope m	Prove that the graph of the line $y = mx + b$ has the slope m.
	
Because of similar triangles, corresponding sides are proportional. $\frac{y}{m} = \frac{x}{1}$ $y = mx$	$\frac{y-b}{m} = \frac{x}{1}$ $y - b = mx$ $+b \quad +b$ $y = mx + b$
SLOPE is m	

SLOPE-INTERCEPT FORM OF A LINE

$$y = mx + b$$

m: slope

b: y-intercept.

$y = \frac{3}{4}x + \frac{1}{2}$

NAME:_____ Math _____ , Period _____

Mr. Rogove Date:_____

Guided Practice:

Steps for Identifying Slope using Slope Intercept Form ($y = mx + b$)

1. Read the situation carefully and write your equation in slope intercept form.
2. If necessary, manipulate equation written in standard form to solve for y and put into slope intercept format.
3. The slope will be the coefficient of the *x*-variable (or *m*)

Jessica is training for a marathon. She runs 4 miles in 28 minutes. Assume she runs at a constant rate. Write an equation to represent the total distance *(y)* she can run in *x* minutes. $\frac{y}{x} = \frac{4}{28}$ $\frac{y}{x} = \frac{1}{7}$ $y = \frac{1}{7}x$ Slope is $\frac{1}{7}$. Jessica runs $\frac{1}{7}$ of a mile every minute	Four boxes of pencils cost \$5.00. Write an equation that represents the total cost of pencils (y) for x number of boxes of pencils. $y = \frac{5}{4}x$ Slope $= \frac{5}{4}$ Each box of pencils cost \$1.25
Aidan has \$35 in his savings account. Each week he plans on depositing \$20. Write an equation that represents the amount of money (y) he will have saved after x weeks. $y = mx + b$ $b = 35$ $m = 20$ $y = 20x + 35$ Weekly savings Beginning amount	It costs \$100 to sign up for cell phone service, and then the monthly charge for talk and data each month is \$75. Write an equation that represents the total cost of cell phone service (y) for x months. $y = 75x + 100$ Slope $m = 75$

NAME:_____ Math _____ , Period _____

Mr. Rogove Date:_____

Solve the following equation for y and identify the slope: $9x - 3y = 15$ $-9x \quad -9x$ $\frac{-3y}{-3} = \frac{-9x}{-3} + \frac{15}{-3}$ $y = 3x - 5$ $m = 3$	Solve the following equation for y and identify the slope: $6x - 8y = 48$ $-6x \quad -6x$ $\frac{-8y}{-8} = \frac{-6x}{-8} + \frac{48}{-8}$ $y = \frac{3}{4}x - 6$ $m = \frac{3}{4}$
Solve the following equation for y and identify the slope: $2x + 3y = -6$ $-2x \quad -2x$ $\frac{3y}{3} = \frac{-2x}{3} - \frac{6}{3}$ $y = -\frac{2}{3}x - 2$ $m = -\frac{2}{3}$	Solve the following equation for y and identify the slope: $5x + 9y = 8$ $-5x \quad -5x$ $\frac{9y}{9} = \frac{-5x + 8}{9}$ $y = -\frac{5}{9}x + \frac{8}{9}$ $m = \frac{-5}{9}$

NAME:_____ Math _____ , Period _____

Mr. Rogove Date:_____

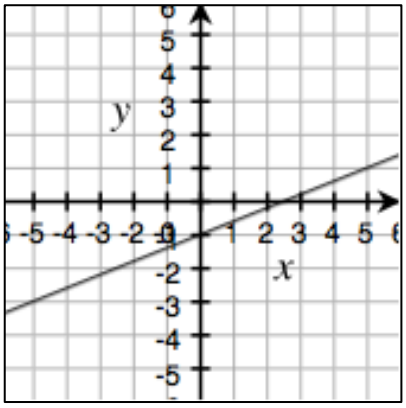
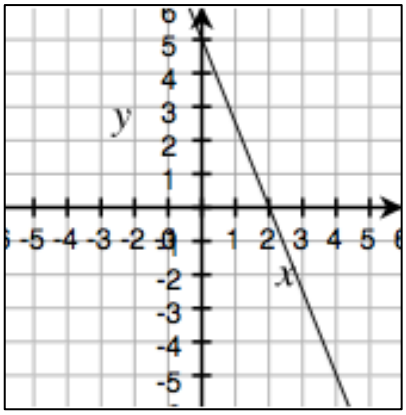
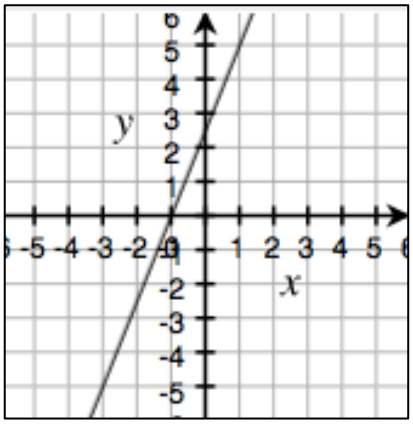
Independent Practice:

Mr. Rogove has 143,000 coins already for the coin drive. If his awesome students contribute 3,231 coins each day, how many coins *(y)* will he have after *x* days.	Rachel had \$300 in her savings account. Each month she deposited \$45 from her allowance. Write an equation that represents her balance in dollars (y) after *x* months.
Solve the following equation for *y* and identify the slope: $-7x + 4y = 16$	Solve the following equation for *y* and identify the slope: $3x - 8y = 32$
Solve the following equation for *y* and identify the slope: $4x + 15y = -60$	Solve the following equation for *y* and identify the slope: $x - 4y = -17$

NAME:_____ Math _____ , Period _____

Mr. Rogove Date:_____

Match the equations with the graphs.

1. $5x + 2y = 10$	i. $y = \frac{5}{2}x + \frac{5}{2}$	A. 
2. $-5x + 2y = 5$	ii. $y = \frac{2}{5}x - 1$	B. 
3. $2x - 5y = 5$	iii. $y = -\frac{5}{2}x + 5$	C. 

NAME:_____ Math _____ , Period _____

Mr. Rogove Date:_____

Closure:

Solve for *y* and identify the slope of the line:

$$ax + by = c$$

$-ax \qquad -ax$

$$\frac{by}{b} = \frac{-ax}{b} + \frac{c}{b}$$

$$y = -\frac{a}{b}x + \frac{c}{b}$$

$$m = -\frac{a}{b}$$

Teacher Notes:

Lesson 17 from Module 4, grade 8

Khan Identifying the slope of a line due 12/16