

## **Apptivity – Slope Intercept Form**

### **Overview:**

Investigating Linear Equations consists of two graphing activities designed to help students explore and learn the concept of linearity using a graphing app (ex. Quick Graph).

These activities are not meant to substitute but supplement regular class hours.

This apptivity is best suited for classes with 1:1 iPads.

### **Time:**

Each activity ideally should take 1 class period (i.e 50 minutes).

### **Goal:**

1. Students will be able to solve a linear equation for  $y$  and identify the slope and  $y$  intercept of the line.
2. Students will deepen their understanding of how changes in the slope of a line affect the steepness and direction of the line.
3. Students will be able to write a standard equation in slope-intercept form.

**Requirements:**

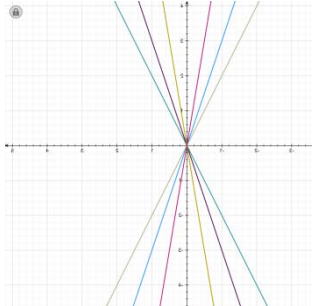
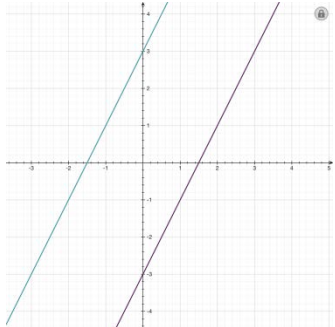
- Teachers should have the knowledge and skills of using the app they will be using with the students. Students learn best when teacher demonstrates how to use the graphing app.  
Download and explore Quick Graph by clicking on this link  
<https://itunes.apple.com/ae/app/quick-graph-your-scientific/id292412367?mt=8>  
For those students who will be using their laptops, they can use Google for graphing and MS Word or MS PowerPoint for creating their portfolio.
- Students can use apps like Creative Book Builder, Note Anytime, Educlipper or similar apps for creating portfolio.

**ALEKS Topic Mastery Alignment:**

- Reading a point in the co-ordinate plane
- Plotting a point in the co-ordinate plane
- Creating a table for a linear function
- Graphing a line given its x- and y-intercepts
- Graphing a line given its equation in slope-intercept form
- Graphing a line given its equation in standard form
- Finding a slope of a line given its equation
- Solving for x- and y-intercepts
- Solving a two-step equation with integers
- Solving a two-step equation with signed fractions

**Exploration:**

Students can explore and note down the properties of different straight line graphs by looking at the following equations:

<p><math>y = 2x</math> <math>y = 3x</math> <math>y = 6x</math> <math>y = -2x</math> <math>y = -3x</math> <math>y = -6x</math></p> 	<ul style="list-style-type: none"><li>- The effect of changes of <math>m</math> on the direction of the <math>y - intercept</math></li><li>- The effect of changes of <math>m</math> on the direction of the line</li><li>- Students can also be told to observe that as the slope increases or decreases the line moves closer to the <math>y - axis</math> (becomes steep)</li></ul>
<p><math>y = 2x + 3</math> <math>y = 2x - 3</math> <math>y = -4x + 5</math> <math>y = -4x + 5</math></p> 	<ul style="list-style-type: none"><li>- The effect of changes of <math>b</math> on <math>slope</math></li></ul>

### Worked Example

$$2x - y - 6 = 0$$

$$m = \frac{2}{1}$$

$$x - \text{intercept} = 3$$

$$y - \text{intercept} = -6$$

Solve for  $y$

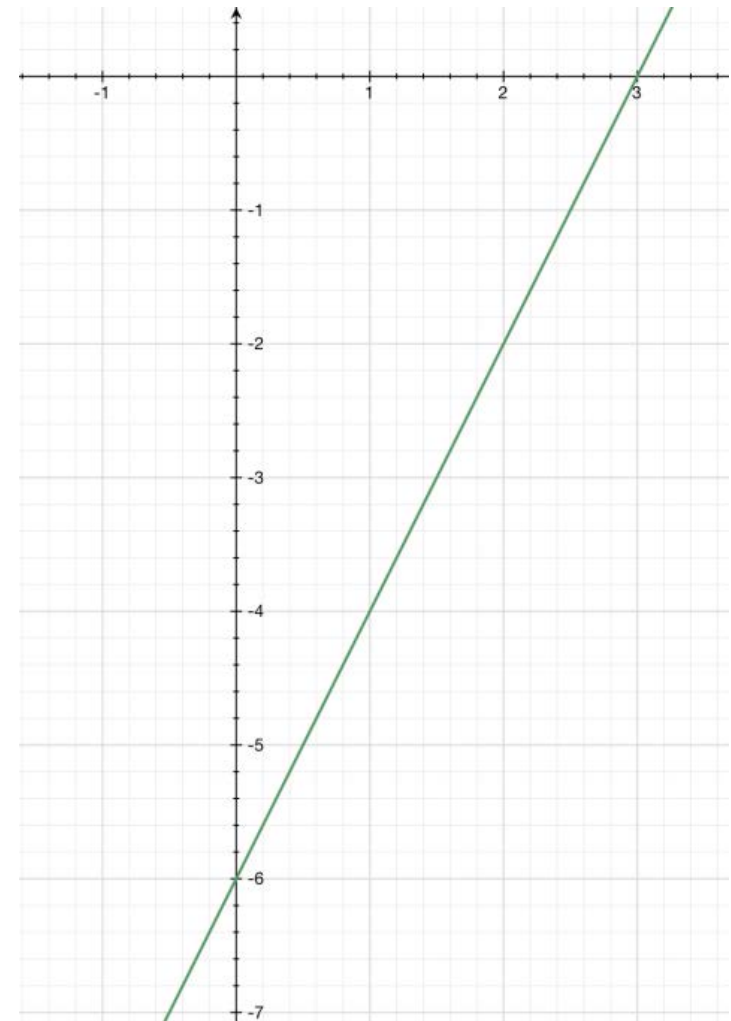
$$2x - 6 = y$$

**Rule:  $y = 0$**

$$2x - 6 = 0$$

$$2x = 6$$

$$x = 3$$



## Activity 1

### Graphing Lines using Quick Graph

Total Marks: 15

**Objective:** To understand how the value of slope  $m$  affects the graph of a straight line

#### Marking Rubric for Activity # 1

*	Find slope (1 mark)	Find y-intercept (1 mark)	Graph (1 mark)	Total
$y = 5$				
$x = -8$				
$y = -8x$				
$y = x - 3$				
$y = -3x + 7$				

**Instructions:** Students should be put into groups of 3 or 4, with each students having their own iPad.

Teachers ask the students to graph the equations (see\*) and note down their slope and y-intercepts on the students handout provided on the next page.

Teachers can ask students to save each graph to later create a portfolio.

Teachers close the apptivity with a class discussion.

## Student Handout 1

	Slope	y-intercept	Discussion
$y = 5$			For the equation $y = 5$ , the slope is _____ and the line is slanting/horizontal/vertical.
$x = -8$			
$y = -8x$			For the equation $x = 5$ , the slope is _____ and the line is slanting/horizontal/vertical.
$y = x - 3$			
$y = -3x + 7$			The y-intercept is where the graph crosses the _____.

### Closure: Journal Entry/Discussion

- Write a paragraph/or discuss about what you learned from activity # 1.

## Activity 2

### Solving for $y$ , then graphing lines using Quick Graph

Total Marks: 20

**Objective:** To understand how to graph equations those are not in slope-intercept form

#### Marking Rubric for Activity # 2

	Solve for $y$ (1 mark)	Find slope (1 mark)	Find x-intercept (1 mark)	Find y-intercept (1 mark)	Graph (1 mark)	Total
$2x + y - 3 = 0$						
$y + 3x = 4$						
$5x - y = 15$						
$2y + 5x - 7 = 0$						

**Instructions:** Teachers ask the students to graph the equations (see\*\*) and note down their slope and intercepts on the students handout provided on the next page.

Teachers can ask students to save each graph to later create a portfolio.

Teachers close the activity with a class discussion.



## Student Handout 2

**	Solve for y (Slope-Intercept Form)	Slope	x-intercept	y-intercept
$2x + y - 3 = 0$				
$y + 3x = 4$				
$5x - y = 15$				
$2y + 5x - 7 = 0$				

### Closure: Journal Entry/Discussion

- Write a paragraph/or discuss about what you learned from activity # 2.  
Discussion should (but not limited to) center around:
  - o The effect of changes of  $m$  on the direction of the  $y - intercept$
  - o The effect of changes of  $m$  on the direction of the line
  - o Equation of a line in slope-intercept form