



Graphing Linear Equations

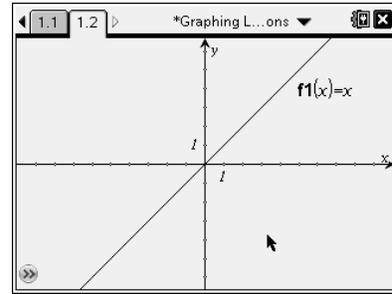
Student Activity

Name _____

Class _____

Open the TI-Nspire document *Graphing_Linear_Equations.tns*.

What happens to the equation of a line if you change the line's position or direction? In this activity, you will explore the answer to that question.



Your teacher might have you create the TI-Nspire document. If so, you will receive a document entitled *Graphing_Linear_Functions_Create*. Follow the instructions to create the TI-Nspire document.

Press (ctrl) ▶ and (ctrl) ◀ to navigate through the lesson.

Otherwise, use the TI-Nspire document entitled *Graphing_Linear_Functions.tns*, which has already been created.

Move to page 1.2.

- Grab the line near the middle of the graph, and move it vertically up and down. Shift the line vertically to three different locations and record the equation, slope, and y-intercept for each location in the table below.

| | | |
|-----------|--------|--------------|
| equation: | slope: | y-intercept: |
| equation: | slope: | y-intercept: |
| equation: | slope: | y-intercept: |

Note: See the document *Graphing_Linear_Functions_Create* for more directions.

- What do you notice about the slopes and about the y-intercepts?
 - What is the relationship between the y-intercept and the equation? Explain your thinking.



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Perform the “undo” feature until the graph is $f1(x) = x$. Do this by pressing ctrl esc one or more times.

If you “undo” too many times, “redo” is ctrl Y .

3. Move the line to $f1(x)=2x+1$. Grab the line near either “end” of the graph where you see the circular arrows, and move the graph to three different positions. Write the equation, slope, and y-intercept of the line for each position.

| | | |
|--------------|--------|--------------|
| 1. equation: | slope: | y-intercept: |
| 2. equation: | slope: | y-intercept: |
| 3. equation: | slope: | y-intercept: |

4. a. What do you notice about the slopes and y-intercepts?

b. Why does only one part of the equation change?

5. Suppose you have the graph of $f1(x)=2x+3$. Describe how you think each graph below will compare to $f(x) = 2x+3$. Explain your reasoning. Check your prediction using the .tns file.

a. $f1(x)= 2x-4$

b. $f1(x) = -4x+3$

6. How would you explain to someone who was not in class the connection between the y-intercept and slope of the graph of a line and the equation of the line?