EXPLORATIONS

Activity 1

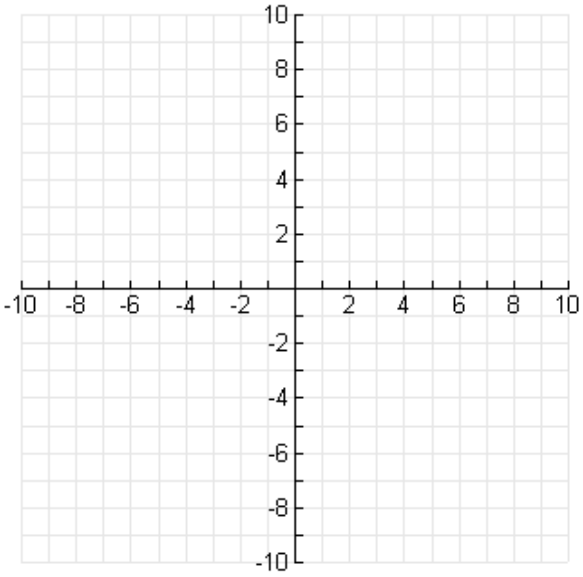
Investigating Slope and Y-Intercept

The slope-intercept form of a line is $y = mx + b$. In this activity, you will investigate the effect of changing each of the parameters m and b on the graph of the line.

Slope Exploration

1. Open a new TI InterActive! document. Title this document **Investigating Slope and Y-Intercept**. Add your name and the date to this document.

2. Select Graph  and define y1(x): = x. Click in the checkbox to the left of $y1(x)$ to select the equation. Sketch the graph of y1(x): = x on the provided grid.



3. Define and select y2(x): = 2x. Sketch the graph of y2(x): = 2x on the same grid.

4. Define and select y3(x): = 3x. Sketch the graph of y3(x): = 3x on the same grid.

5. Define and select y4(x): = 4x. Sketch the graph of y4(x): = 4x on the same grid.

6. Click on Save to Document  to paste the graphs into your TI InterActive! document.

Slope Analysis

1. Identify the parameter *m* in the equations graphed in questions 2 through 5.

   A. y1(x): = x *m* = _____

   B. y2(x): = 2x *m* = _____

   C. y3(x): = 3x *m* = _____

   D. y4(x): = 4x *m* = _____

2. In questions 2 through 5 of the *Slope Exploration*, the parameter *m* was changed. Describe the effect that increasing the value of *m* has on the graph of $y = mx + b$.

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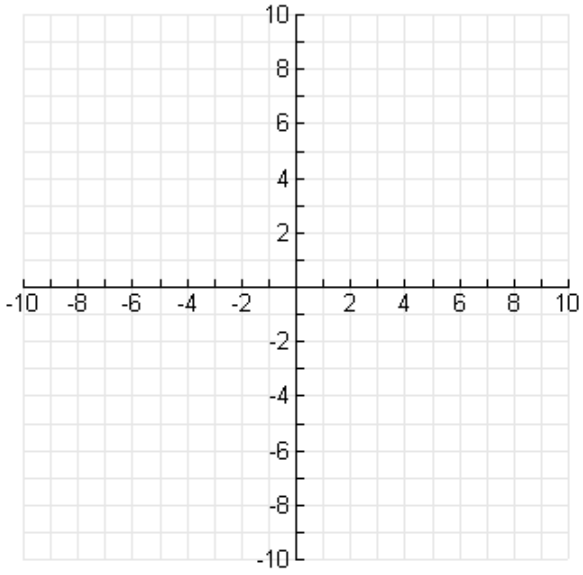
3. Select Graph  to open a new graphing window and define y1(x): = x. Click in the checkbox to the left of *y*1(*x*) to select the equation. Sketch the graph of y1(x): = x on the provided grid.



4. Define and select y2(x): = (1/2)x. Sketch the graph of y2(x): = (1/2)x on the same grid.

5. Define and select y3(x): = (1/3)x. Sketch the graph of y3(x): = (1/3)x on the same grid.

6. Define and select y4(x): = (1/4)x. Sketch the graph of y4(x): = (1/4)x on the same grid.

7. Click on Save to Document  to paste the graphs into your TI InterActive! document.

8. In questions 3 through 6 of the *Slope Analysis*, the parameter *m* was changed. Identify the slope of each line and describe the effect that decreasing the value of *m* has on the graph of $y = mx + b$.

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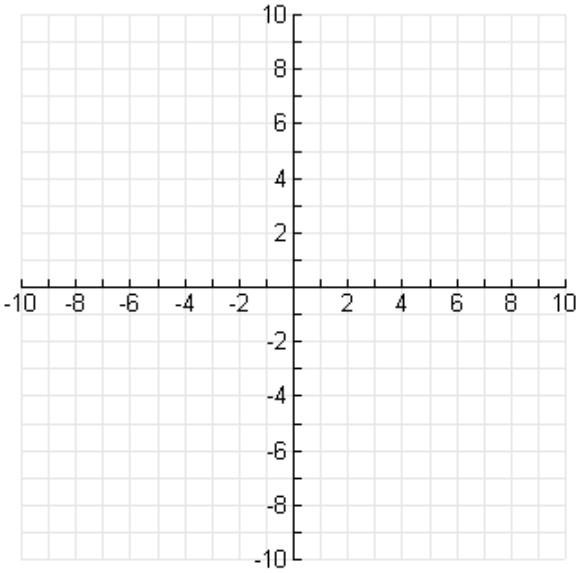
9. Select Graph  to open a new graphing window and define y1(x): = x. Click in the checkbox to the left of *y*1(*x*) to select the equation. Sketch the graph of y1(x): = x on the provided grid.



10. Define and select y2(x): = -x. Sketch the graph of y2(x): = -x on the same grid.

11. Define and select y3(x): = -2x. Sketch the graph of y3(x): = -2x on the same grid.

12. Define and select y4(x): = (-1/2)x. Sketch the graph of y4(x): = (-1/2)x on the same grid.

13. Click on Save to Document  to paste the graphs into your TI InterActive! document.

14. In questions 9 through 12 the parameter *m* was changed. Identify the slope of each line and describe the effect that changing *m* has on the graph of $y = mx + b$.

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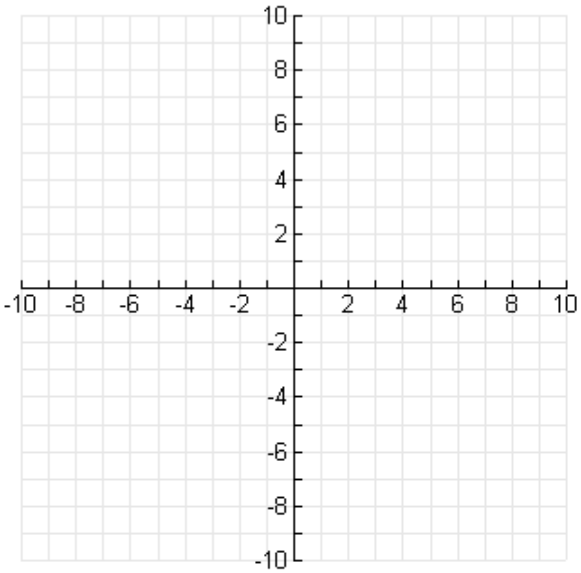
Y-Intercept Exploration

1. Select Graph  to open a new graph window and define y1(x): = x. Click in the checkbox to the left of *y*1(*x*) to select the equation. Sketch the graph of y1(x): = x on the provided grid.



2. Define and select y2(x): = x + 2. Sketch the graph of y2(x): = x + 2 on the same grid.

3. Define and select y3(x): = x − 1. Sketch the graph of y3(x): = x − 1 on the same grid.

4. Define and select y4(x): = x + 5. Sketch the graph of y4(x): = x + 5 on the same grid.

5. Click on Save to Document  to paste the graphs into your TI InterActive! document.

Y-Intercept Analysis

1. Identify the parameter *b* in the equations graphed in questions 2 through 4.

   A. y1(x): = x *b* = _____

   B. y2(x): = x + 2 *b* = _____

   C. y3(x): = x − 1 *b* = _____

   D. y4(x): = x + 5 *b* = _____

2. In questions 2 through 4 of the *Y-Intercept Exploration*, the parameter *b* was changed. Describe the effect that increasing and decreasing the value of *b* has on the graph of $y = x$.

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3. Double-click on the last graph. Click on Trace. Click on each graph and trace to determine the *y*-value for which *x* is 0.

   A. y1(x): = x *y* = _____

   B. y2(x): = x + 2 *y* = _____

   C. y3(x): = x − 1 *y* = _____

   D. y4(x): = x + 5 *y* = _____

4. The values found in question 3 of the *Y-Intercept Analysis* are called the *y*-intercepts. How do they compare to the values of *b*?

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5. Click on Save to Document  to paste the graphs into your TI InterActive! document.

6. Save this document as **slope.tii**. Print a copy of this document.

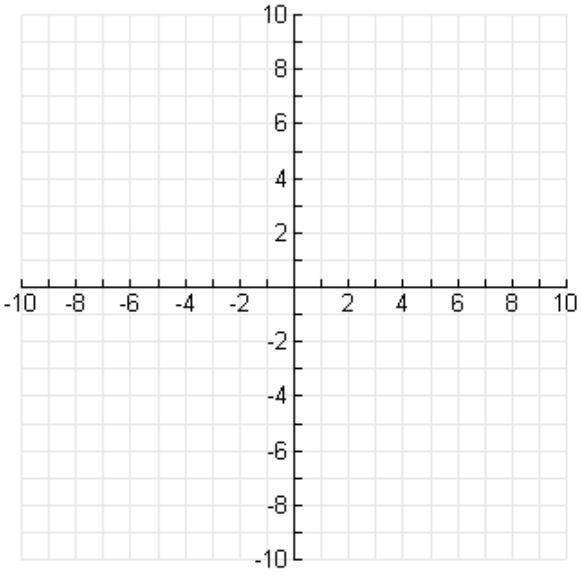
Additional Exercises

For each of the following, sketch their graphs. Then state the slope and *y*-intercept.

1. $y = 4x + 2$

   $m =$ _____

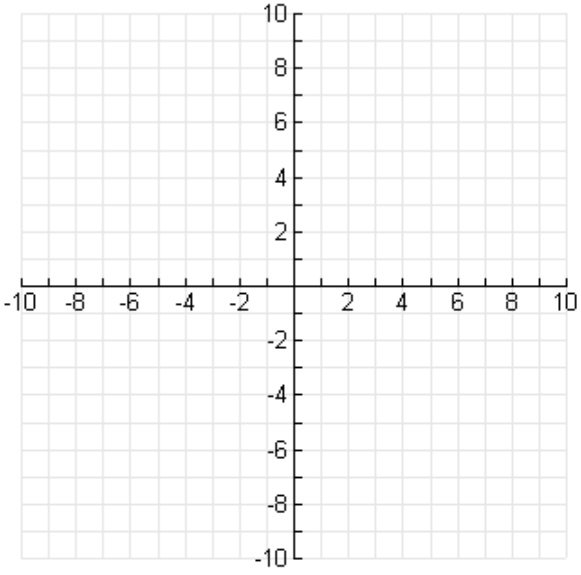
   $b =$ _____



2. $y = -3x - 6$

   $m =$ _____

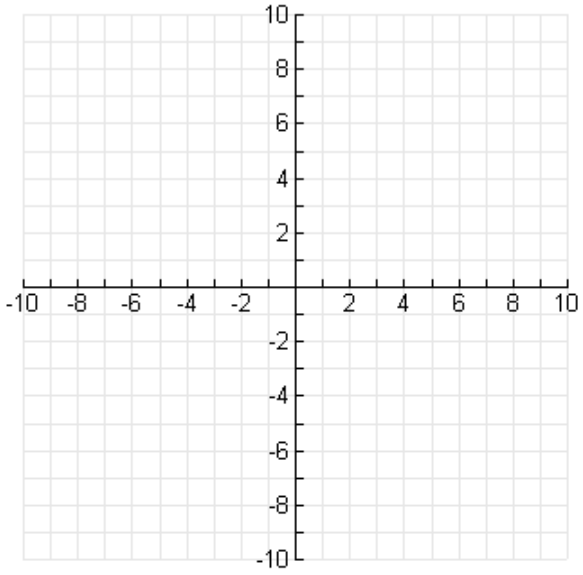
   $b =$ _____



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

m= _____

b= _____



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

m = _____

b = _____