REASONING 4.7

DEVELOPING CONCEPTS

Slope-Intercept Form

For use with Lesson 4.7

GOAL

Determine the effect that the slope and *y*-intercept have on the graph of $y = mx + b$.

MATERIALS

- graph paper
- pencil

Question

How do the slope and *y*-intercept affect the graph of $y = mx + b$?

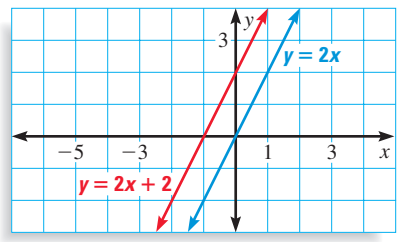
Explore

1 Graph each equation on the same coordinate plane. Describe any patterns you see.

a. $y = 2x$

b. $y = 2x + 2$

c. $y = 2x - 2$



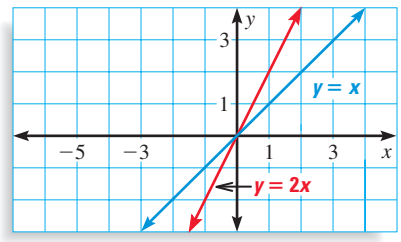
2 For each equation in Step 1, give the slope of the line and write the coordinates of the point where the graph crosses the *y*-axis.

3 Graph each equation on the same coordinate plane. Describe any patterns you see.

a. $y = x$

b. $y = 2x$

c. $y = 3x$



4 For each equation in Step 3, give the slope of the line and write the coordinates of the point where the graph crosses the *y*-axis.

Think About It

1. Based on your results in Steps 1 and 2, predict what the graph of $y = 2x + 5$ will look like. Predict the *y*-intercept. Explain your prediction.

2. Test your prediction by graphing the equation $y = 2x + 5$.

3. Based on your results in Steps 3 and 4, predict what the graph of $y = 5x$ will look like. Predict the slope. Explain your prediction.

4. Test your prediction by graphing the equation $y = 5x$.

5. Based on your observations, what information do you think the numbers *m* and *b* give you about a graph? Use graphs to support your answer.