Lesson 14: The Graph of a Linear Equation—Horizontal and Vertical Lines

Classwork

Exercises

1. Find at least four solutions to graph the linear equation $1x + 2y = 5$.

2. Find at least four solutions to graph the linear equation $1x + 0y = 5$.

3. What was different about the equations in Exercises 1 and 2? What effect did this change have on the graph?

4. Graph the linear equation $x = -2$.

5. Graph the linear equation $x = 3$.

6. What will the graph of $x = 0$ look like?

7. Find at least four solutions to graph the linear equation $2x + 1y = 2$.

8. Find at least four solutions to graph the linear equation $0x + 1y = 2$.

9. What was different about the equations in Exercises 7 and 8? What effect did this change have on the graph?

10. Graph the linear equation $y = -2$.

11. Graph the linear equation $y = 3$.

12. What will the graph of $y = 0$ look like?

Lesson Summary

In a coordinate plane with perpendicular x- and y-axes, a *vertical line* is either the y-axis or any other line parallel to the y-axis. The graph of the linear equation in two variables $ax + by = c$, where $a = 1$ and $b = 0$, is the graph of the equation $x = c$. The graph of $x = c$ is the vertical line that passes through the point $(c, 0)$.

In a coordinate plane with perpendicular x- and y-axes, a *horizontal line* is either the x-axis or any other line parallel to the x-axis. The graph of the linear equation in two variables $ax + by = c$, where $a = 0$ and $b = 1$, is the graph of the equation $y = c$. The graph of $y = c$ is the horizontal line that passes through the point $(0, c)$.

Problem Set

1. Graph the two-variable linear equation $ax + by = c$, where $a = 0$, $b = 1$, and $c = -4$.

2. Graph the two-variable linear equation $ax + by = c$, where $a = 1$, $b = 0$, and $c = 9$.

3. Graph the linear equation $y = 7$.

4. Graph the linear equation $x = 1$.

5. Explain why the graph of a linear equation in the form of $y = c$ is the horizontal line, parallel to the x-axis passing through the point $(0, c)$.

6. Explain why there is only one line with the equation $y = c$ that passes through the point $(0, c)$.