Lesson Plan -- Graphing

Chapter Resources
- Lesson 5-12 Ordered Pairs
- Lesson 5-13 Plot Points in the Coordinate Plane
- Lesson 5-15 Graph Linear Equations
- Lesson 5-12 Ordered Pairs Answers
- Lesson 5-13 Plot Points in the Coordinate Plane Answers
- Lesson 5-15 Graph Linear Equations Answers
**Making an Input-Output Table**

Complete the input-output table for the rule \( y = x - 1 \).

**Solution**

Substitute each input value for \( x \) in the rule. Then simplify to find the output values \( y \).

<table>
<thead>
<tr>
<th>Input, ( x )</th>
<th>(-3)</th>
<th>(-1)</th>
<th>(0)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output, ( y )</td>
<td>(-3 - 1 = -4)</td>
<td>(-1 - 1 = -2)</td>
<td>(0 - 1 = -1)</td>
<td>(5 - 1 = 4)</td>
</tr>
</tbody>
</table>

**TRY THIS**  Make a table.

1. Complete the input-output table for the rule \( y = 2x \).

<table>
<thead>
<tr>
<th>Input, ( x )</th>
<th>(-2)</th>
<th>(0)</th>
<th>(1)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output, ( y )</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Complete the input-output table for the rule \( y = x + 5 \).

<table>
<thead>
<tr>
<th>Input, ( x )</th>
<th>(-3)</th>
<th>(-1)</th>
<th>(2)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output, ( y )</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Words to Remember**

Ordered pair: A pair of numbers represented by \( x \) and \( y \) and written in the form \((x, y)\)

Input: The values of \( x \) or of the first numbers in the ordered pairs

Output: The values of \( y \) or of the second numbers in the ordered pairs

Equation in two variables: A rule relating input and output values
Writing Ordered Pairs from a Table

Write the values in the table as ordered pairs.

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>y</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>6</td>
<td>9</td>
</tr>
</tbody>
</table>

Solution

\((-3, 1), (-1, 3), (0, 4), (2, 6), (5, 9)\)

Try this

Write ordered pairs.

3. Write the values in the table as ordered pairs.

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td>-15</td>
<td>-5</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>y</td>
<td>-3</td>
<td>-1</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

Writing a Rule from an Input-Output Table

Write a rule that shows how \(y\) relates to \(x\).

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td>-6</td>
<td>-3</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>y</td>
<td>-2</td>
<td>1</td>
<td>4</td>
<td>9</td>
</tr>
</tbody>
</table>

Solution

The \(y\)-values are 4 more than the corresponding \(x\)-values. Therefore, the rule is \(y = x + 4\).

Try this

Write a rule.

4. Write a rule that shows how \(y\) relates to \(x\).

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td>-2</td>
<td>-1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>y</td>
<td>-6</td>
<td>-3</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

5. Write a rule that shows how \(y\) relates to \(x\).

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td>-4</td>
<td>-2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>y</td>
<td>-7</td>
<td>-5</td>
<td>-3</td>
<td>-1</td>
</tr>
</tbody>
</table>
Summarize

Making an Input-Output Table
Using a rule describing a relationship between two values \( x \) and \( y \), substitute input values for \( x \) to find the corresponding output values for \( y \).

Writing Ordered Pairs from a Table
The \( x \)-values or input values are the first number in each ordered pair. The \( y \)-values or output values are the second.

Writing a Rule from an Input-Output Table
Look for a relationship between the \( x \)-values and the \( y \)-values. Find the pattern that determines how each value of \( y \) can be obtained from the corresponding value of \( x \).

Practice

Complete the input-output table using the given rule.

1. \( y = 4x \)

<table>
<thead>
<tr>
<th>Input, ( x )</th>
<th>1</th>
<th>2</th>
<th>5</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output, ( y  )</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. The number of sailboats \( x \) is 20 less than the number of speed boats \( y \).

<table>
<thead>
<tr>
<th>Sailboats, ( x )</th>
<th>0</th>
<th>2</th>
<th>3</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed boats, ( y  )</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Write the values in the table as ordered pairs.

3. |
\[ \begin{array}{c|cccc}
 x & -6 & -2 & 1 & 4 \\
----&----&----&----&----
 y & -8 & -4 & -1 & 2 \\
\end{array} \]

4. |
\[ \begin{array}{c|cccc}
 x & -3 & -2 & -1 & 0 \\
----&----&----&----&----
 y & 4 & 5 & 6 & 7 \\
\end{array} \]
Write a rule that shows how $y$ relates to $x$.

5. $\begin{array}{c|cccc} x & -1 & 0 & 1 & 2 \\ \hline y & 4 & 0 & -4 & -8 \end{array}$

6. $\begin{array}{c|cccc} x & -1 & 0 & 1 & 2 \\ \hline y & -2 & -1 & 0 & 1 \end{array}$

7. $\begin{array}{c|cccc} x & -3 & 0 & 6 & 12 \\ \hline y & -1 & 0 & 2 & 4 \end{array}$

8. Explain how to identify the input values in the ordered pairs $(-2, -1), (7, 6), \text{ and } (10, 9)$.

9. The distance $d$ that Maria travels in $h$ hours can be described by the rule $d = 50h$. Write three ordered pairs that make the rule true.

10. Did you get it?
   - **Fill in the missing words.** In the ordered pair $(x, y)$, the value of ________ is the input and the value of ________ is the output.

11. **Describe a process.** How would you write a rule that shows how $y$ relates to $x$?

   $\begin{array}{c|cccc} x & -2 & -1 & 0 & 1 \\ \hline y & -8 & -4 & 0 & 4 \end{array}$

12. **Explain your reasoning.** Can the relationship between the number of weeks that have passed and the number of years that have passed be described by a rule relating two variables $w$ and $y$? Explain.
Plot Points in the Coordinate Plane

Words to Remember

- **x-axis:** The horizontal axis
- **y-axis:** The vertical axis
- **Origin:** The point \((0, 0)\), where the horizontal and vertical axes intersect

Getting Started
In Lesson 5-12 you learned how to write ordered pairs from an input-output table. In this lesson you will graph ordered pairs in a coordinate plane.

Example 1 Identifying Points in a Coordinate Plane

Name the two points on the graph with the coordinates \((-4, 0)\) and \((1, -3)\).

**Solution**
Starting at the origin, if you move left 4 units, then up 0 units, you get to \(C\). Point \(C\) has coordinates \((-4, 0)\).

Starting at the origin, if you move right 1 unit, then down 3 units, you get to \(F\). Point \(F\) has coordinates \((1, -3)\).
Use the graph in Example 1 to name the point with the given coordinates.

1. \((4, 0)\)

If you move _______ 4 units, then up _______ units you get to point _______. Point _______ has coordinates \((4, 0)\).

2. \((-3, -2)\)

If you move left _______ units, then _______ 2 units you get to point _______. Point _______ has coordinates \((-3, -2)\).

Graph the points \(A(-5, 2), B(4, 1),\) and \(C(0, -3)\).

Solution

To graph \(A\) move left 5 units. Then move up 2 units.

To graph \(B\) move right 4 units. Then move up 1 unit.

To graph \(C\) do not move right or left. Just move down 3 units.

Graph the points \(X(-2, -4), Y(-1, 3),\) and \(Z(2, 0)\).

To graph \(X\) move left _______ units. Then move _______ 4 units.

To graph \(Y\) move _______ 1 unit. Then move up _______ units.

To graph \(Z\) just move _______ _______ units. Do not move _______ or _______ units.
Summarize

Identifying Points in a Coordinate Plane

1. To name the coordinates of a point on a coordinate graph, first find the $x$-coordinate by counting how many units the point is to the left or right of the origin.

2. Then find the $y$-coordinate by counting how many units the point is above or below the origin.

3. Write the coordinates as an ordered pair with the $x$-coordinate first and the $y$-coordinate second.

Plotting a Point in a Coordinate Plane

1. To plot a point, start at the origin and move right or left the number of units corresponding to the $x$-coordinate. Move right if the $x$-coordinate is positive, move left if it is negative.

2. Then move up or down the number of units corresponding to the $y$-coordinate. Move up if the $y$-coordinate is positive, move down if it is negative.

3. Make a dot at this location.

Practice

In Exercises 1–7, write the coordinates of the points.

1. Point $A$ is 1 unit right and 6 units down from the origin, so the coordinates of $A$ are _________.

2. Point $B$ is 4 units right and 1 unit up from the origin, so the coordinates of $B$ are _________.

3. Point $C$ is _______ units right and 3 units _______ from the origin, so the coordinates of $C$ are _________.

4. Point $D$ is _______ units _______ and _______ units _______ from the origin, so the coordinates of $D$ are _________.

5. Point $E$ is _______ units _______ from the origin, so the coordinates of $D$ are _________.

6. The coordinates of $F$ are _______.

7. The coordinates of $G$ are _______.
Plot the point.

8. \( M(-6, 2) \)  
9. \( N(0, 1) \)
10. \( P(-3, -4) \)  
11. \( Q(8, -1) \)
12. \( R(5, 6) \)  
13. \( S(-2, 0) \)
14. \( O(0, 0) \)  
15. \( U(0, -7) \)
16. \( V(-1, 8) \)  
17. \( W(2, -6) \)
18. \( X(0, -2) \)  
19. \( Y(3, 1) \)

20. Describe the coordinates of a point that lies on either the \( x \)-axis or the \( y \)-axis.
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

21. **Fill in the missing words.** The horizontal axis in a coordinate plane is called the ______ and the vertical axis is called the ________.

22. **Describe a process.** How would you explain to your friend how to graph the point \((6, -1)\)?
________________________________________________________________________
________________________________________________________________________

23. **Explain your reasoning.** Fred says the coordinates of point \( M \) are \((4, -2)\). Vicki says the coordinates are \((-2, 4)\). Who is correct? Explain.
________________________________________________________________________
________________________________________________________________________
Graph Linear Equations

Words to Remember

Graph of a linear equation: All the points in the coordinate plane that are solutions of the equation.
The graph is a horizontal, vertical, or diagonal line.

Getting Started

In Lesson 5-13 you learned how to plot points in a coordinate plane. In this lesson you will learn how you can plot points to graph a line.

Example

Graphing Linear Equations Using a Table of Values

Use the table of values to graph \( y = x + 3 \). Interpret the graph by explaining how you know that the point \((10, 13)\) also lies on the graph of the line.

Solution

Step 1 Complete the table.

<table>
<thead>
<tr>
<th>( x )</th>
<th>(-2)</th>
<th>(-1)</th>
<th>(0)</th>
<th>(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>( y )</td>
<td>( y = x + 3 )</td>
<td>( y = x + 3 )</td>
<td>( y = x + 3 )</td>
<td>( y = x + 3 )</td>
</tr>
<tr>
<td></td>
<td>( y = -2 + 3 )</td>
<td>( y = -1 + 3 )</td>
<td>( y = 0 + 3 )</td>
<td>( y = 1 + 3 )</td>
</tr>
<tr>
<td></td>
<td>= 1</td>
<td>= 2</td>
<td>= 3</td>
<td>= 4</td>
</tr>
<tr>
<td>((x, y))</td>
<td>((-2, 1))</td>
<td>((-1, 2))</td>
<td>((0, 3))</td>
<td>((1, 4))</td>
</tr>
</tbody>
</table>

Step 2 Plot the points.

Step 3 Draw a line through the points.

Step 4 Interpret the graph. Every ordered pair that makes \( y = x + 3 \) true is a solution of the equation and lies on its graph. Since \( 13 = 10 + 3 \), \((10, 3)\) is a solution of \( y = x + 3 \) and lies on its graph.
Try this  Use the equation \( y = 2x + 1 \).

1. Fill in the missing information to graph \( y = 2x + 1 \).

Step 1  Complete the table.

<table>
<thead>
<tr>
<th>( x )</th>
<th>( -2 )</th>
<th>( 0 )</th>
<th>( 1 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( y )</td>
<td>( y = 2x + 1 )</td>
<td>( y = 2x + 1 )</td>
<td>( y = __________+___________ )</td>
</tr>
<tr>
<td></td>
<td>( y = 2\cdot__________+___________ )</td>
<td>( y = 2\cdot__________+___________ )</td>
<td>( y = __________+___________ )</td>
</tr>
<tr>
<td>( (x, y) )</td>
<td>( (_______, _______) )</td>
<td>( (_______, _______) )</td>
<td>( (_______, _______) )</td>
</tr>
</tbody>
</table>

Step 2  Plot the points \( (\_\_\_\_\_\_\_, \_\_\_\_\_\_\_) \), \( (\_\_\_\_\_\_\_, \_\_\_\_\_\_\_) \), and \( (\_\_\_\_\_\_\_, \_\_\_\_\_\_\_) \). Then draw a line through the points.

2. The point \((-8, -15)\) also lies on the graph of \( y = 2x + 1 \) because \( \_\_\_\_\_\_\_\_\_\_ = 2 \cdot \_\_\_\_\_\_\_\_\_\_ + \_\_\_\_\_\_\_\_\_\_\_ \).

Example 2  Graphing Horizontal and Vertical Lines

Use three ordered pairs to determine whether the graphs of \( y = -4 \) and \( x = 3 \) are horizontal or vertical.

Solution

Choose 3 values for \( x \). 
\( y \) is always \(-4\).

\( y = -4 \)

\((-2, -4) \) \( (0, -4) \) \( (1, -4) \)

Choose 3 values for \( y \). 
\( x \) is always \( 3 \).

\( x = 3 \)

\((3, -4) \) \( (3, 0) \) \( (3, 3) \)

Answer  The graph of \( y = -4 \) is a horizontal line. 
The graph of \( x = 3 \) is a vertical line.

Try this  Use three ordered pairs to determine whether the graph is horizontal or vertical.

3. \( x = -2 \) 
4. \( y = 1 \)
**Summarize**

**Graphing a Linear Equation**

To graph a linear equation, make a table of values and plot the points. Graph at least three points to determine the line.

**Graphing a Vertical or Horizontal Line**

For a vertical line, \( x \) will have the same value for all values of \( y \). For a horizontal line, \( y \) will have the same value for all values of \( x \).

<table>
<thead>
<tr>
<th>Vertical line</th>
<th>Horizontal line</th>
<th>Diagonal line</th>
</tr>
</thead>
<tbody>
<tr>
<td>( x = 2 )</td>
<td>( y = -10 )</td>
<td>( y = x - 5 )</td>
</tr>
<tr>
<td>( x = -0.5 )</td>
<td>( y = 12 )</td>
<td>( y = -4x + 1 )</td>
</tr>
</tbody>
</table>

**Practice**

Complete the table of values to draw the graph.

1. \( y = x - 1 \)

<table>
<thead>
<tr>
<th>( x )</th>
<th>( -2 )</th>
<th>( -1 )</th>
<th>( 0 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( y )</td>
<td>( y = x - 1 )</td>
<td>( y = x - 1 )</td>
<td>( y = \square )</td>
</tr>
<tr>
<td></td>
<td>( y = \square - 1 )</td>
<td>( y = \square - \square )</td>
<td>( y = \square - \square )</td>
</tr>
<tr>
<td>( (x, y) )</td>
<td>(\square, \square)</td>
<td>(\square, \square)</td>
<td>(\square, \square)</td>
</tr>
</tbody>
</table>

2. \( y = x + 7 \)

<table>
<thead>
<tr>
<th>( x )</th>
<th>(-2)</th>
<th>(0)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>( y )</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. \( y = 2x - 5 \)

<table>
<thead>
<tr>
<th>( x )</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>( y )</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. \( y = 4x + 2 \)

<table>
<thead>
<tr>
<th>( x )</th>
<th>(-1)</th>
<th>(0)</th>
<th>(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>( y )</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. \( y = \frac{-3}{5}x - 1 \)

<table>
<thead>
<tr>
<th>( x )</th>
<th>(-5)</th>
<th>(0)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>( y )</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Complete the table of values to draw the graph.

6. \(x + y = 4\)

<table>
<thead>
<tr>
<th>(x)</th>
<th>-1</th>
<th>0</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>(y)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. \(3x + y = 6\)

<table>
<thead>
<tr>
<th>(x)</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>(y)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8. \(y = 1.5\)

<table>
<thead>
<tr>
<th>(x)</th>
<th>1.5</th>
<th>1.5</th>
<th>1.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>(y)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9. \(x = -2\)

<table>
<thead>
<tr>
<th>(x)</th>
<th>-2</th>
<th>-2</th>
<th>-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>(y)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Tell whether the graph of the equation is a vertical, horizontal, or diagonal line. Explain your reasoning.

10. \(y = 3\)

_________________________________________________________________________________

11. \(x = 4\)

_________________________________________________________________________________

12. \(y = 2x - 6\)

_________________________________________________________________________________

13. **Fill in the missing words.** The graph of a linear equation is a _________, _________, or _________ line.

14. **Describe a process.** How would you graph \(y = \frac{1}{2}x + 3\)?

_________________________________________________________________________________

_________________________________________________________________________________

15. **Explain your reasoning.** Your friend said that the graph of \(x = 2\) is a horizontal line. Is she correct?

_________________________________________________________________________________

_________________________________________________________________________________
Lesson 5-12, pp. 48–51

Try this:
1. –4, 0, 2, 8
2. 2, 4, 7, 9
3. (–15, –3), (–5, –1), (0, 0), (10, 2)
4. \( y = 3x \)
5. \( y = x - 3 \)

Practice:
1. 4, 8, 20, 28
2. 20, 22, 23, 25
3. (–6, –8), (–2, –4), (1, –1), (4, 2)
4. (–3, 4), (–2, 5), (–1, 6), (0, 7)
5. \( y = -4x \)
6. \( y = x - 1 \)
7. \( y = \frac{x}{3} \)

8. Sample answer: The input values are the first values in each ordered pair. The input values are –2, 7, and 10.
9. Sample answer: (1, 50), (2, 100), (3, 150)

10. \( x, y \)
11. Sample answer: Look for a relationship between the \( x \)-values and the \( y \)-values. In the table each \( y \)-value is 4 times the corresponding \( x \)-value, so the rule is \( y = 4x \).

12. yes; 52 weeks in 1 year, so \( w = 52y \)
Try this:
1. right, 0, G, G
2. down, D, D
3. (continued)

Practice:
1. (1, −6)
2. (4, 1)
3. 3; up; (3, 3)
4. 5; left; 2; down; (−5, −2)
5. 4; down; (0, −4)
6. (−3, 5)
7. (−3, 0)
8–19.

20. Sample answer: A point that lies on the x-axis has y-coordinate 0. A point that lies on the y-axis has x-coordinate 0.

21. x-axis; y-axis

22. Sample answer: Start at the origin and move 6 units right and then 1 unit down.

23. Vicki is correct. Sample answer: To get to M you move left 2 units and then up 4 units.
Lesson 5-15, pp. 58–61

Try this: 1. (continued on next page also)

<table>
<thead>
<tr>
<th>x</th>
<th>y = 2x + 1</th>
<th>y = 2x + 1</th>
<th>y = 2x + 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>-2</td>
<td>y = 2(-2) + 1</td>
<td>y = 2(0) + 1</td>
<td>y = 2(1) + 1</td>
</tr>
<tr>
<td>0</td>
<td>= -3</td>
<td>= 1</td>
<td>= 3</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(x, y) (-2, -3) (0, 1) (1, 3)

2. -15; -8; 1
3. vertical
4. horizontal

Practice: 1.

<table>
<thead>
<tr>
<th>x</th>
<th>-2</th>
<th>-1</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>y = x - 1</td>
<td>y = x - 1</td>
<td>y = x - 1</td>
</tr>
<tr>
<td></td>
<td>y = -2 - 1</td>
<td>y = -1 - 1</td>
<td>y = 0 - 1</td>
</tr>
<tr>
<td></td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
</tbody>
</table>

(x, y) (-2, -3) (-1, -2) (0, -1)

2. 5, 7, 9;
3. \(-1, 1, 3;\)  
   ![Graph of a line with points \((-1, 1), (1, 3), \text{ and } (3, 1)\).]

4. \(-2, 2, 6;\)  
   ![Graph of a line with points \((-2, 2), (2, 6), \text{ and } (6, 2)\).]

5. \(2, -1, -4;\)  
   ![Graph of a line with points \((2, -1), (-1, -4), \text{ and } (-4, -1)\).]

6. \(5, 4, 3;\)  
   ![Graph of a line with points \((5, 4), (4, 3), \text{ and } (3, 4)\).]

7. \(3, 0, -3;\)  
   ![Graph of a line with points \((3, 0), (0, -3), \text{ and } (-3, 0)\).]

8. **Sample answer:** \(1, 2, 3;\)  
   ![Graph of a line with points \((1, 2), (2, 3), \text{ and } (3, 2)\).]

9. **Sample answer:** \(1, 2, 3;\)  
   ![Graph of a line with points \((1, 2), (2, 3), \text{ and } (3, 2)\).]

10. The \(y\)-values are the same for each \(x\)-value, so the line is horizontal.
11. The $x$-values are the same for each $y$-value, so the line is vertical.

12. The $x$-values are different for each different $y$-value, so the line is diagonal.

13. horizontal; vertical; diagonal

14. *Sample answer:* Make a table of values choosing at least 3 numbers for $x$.
   To make the arithmetic easier, use even numbers for $x$.
   Substitute them in the equation for $x$ to find the $y$-values. Then graph the ordered pairs and draw a line through them.

15. no; *Sample answer:* For every ordered pair on the graph of $x = 2$, the value of $x$ is 2.
   This means the graph goes through the points $(2, -1)$, $(2, 0)$, and $(2, 1)$, for example.
   This describes a vertical line 2 units to the right of the $y$-axis.