4.1 Graphing Linear Equations in Two Variables

Points and Ordered Pairs

Figure 1: The rectangular coordinate system

Vocabulary

Use the following terms and their definitions to label Figure 1.

1. axes 3. quadrants 5. x-coordinate
2. origin 4. ordered pair 6. y-coordinate
Examples

1. Use Figure 2 to identify the coordinates of each point.
   i) A  iii) C  v) E
   ii) B  iv) D  vi) F

2. Use Figure 3 to plot each ordered pair.
   i) G(-2,1) iii) I(1,5) v) K(0,4)
   ii) H(4,-3) iv) J(-1,-6) vi) L(3,0)

3. Write the quadrant that each ordered pair is located in.
   i) (-5,3) iii) (4,-1) v) (0,7)
   ii) (4,3) iv) (-5,-3) vi) (-2,0)
Checking Solutions

1. Check whether the following ordered pairs are solutions to the equation $x - 3y = 9$.
   
   i) $(3, -2)$  
   ii) $(-2, 3)$  
   iii) $(13, \frac{4}{3})$

The Point Plotting Method

- Calculate several ordered pairs (use negative $x$ values, 0, and positive $x$ values)
- Plot the ordered pairs
- Connect the points with a smooth line (use arrows each end to indicate the line continues)

Examples

Use the point plotting method to graph each line in problems 1-3.

1. $y = 2x$

<table>
<thead>
<tr>
<th>$x$</th>
<th>$y$</th>
<th>Work</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2. $y = 2x - 3$

\[
\begin{array}{|c|c|}
\hline
x & y \\
\hline
& \\
\hline
\end{array}
\]

3. $y = \frac{1}{3}x - 1$

\[
\begin{array}{|c|c|}
\hline
x & y \\
\hline
& \\
\hline
\end{array}
\]
4. Given the graph of the line, complete the table.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>-2</td>
<td>-4</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

5. Given the graph of the line, complete the table. [Hint: You need to find the x and y for one of the points.]

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>-6</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>-2</td>
</tr>
</tbody>
</table>