

### Topic 8.1: Integers on the Coordinate Plane

**Coordinate Plane** – a grid containing two number lines that intersect in a right angle at zero.

**X-axis** – the axis that runs horizontally from left to right.

**Y-axis** – the axis that runs vertically from bottom to top.

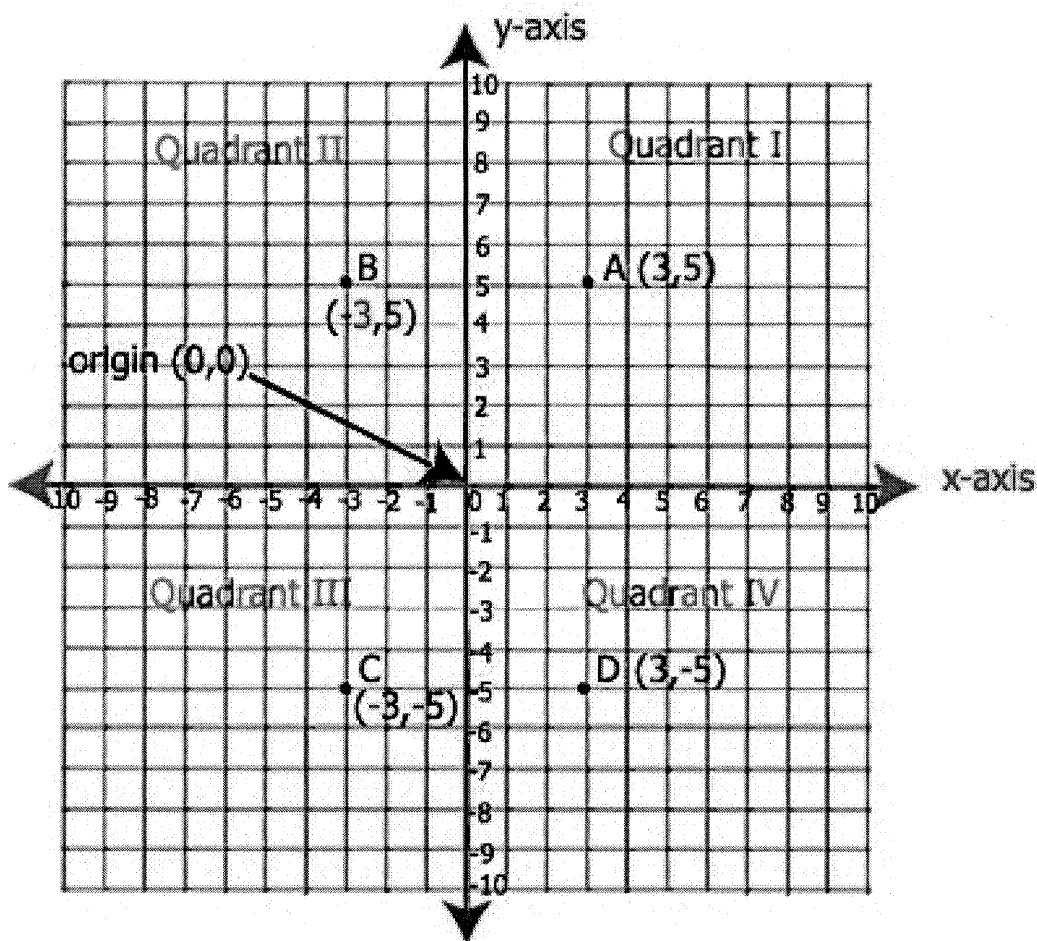
**Quadrants** – the x- and y-axes divide the coordinate plane into four quadrants.

**Ordered pair** –  $(x, y)$  a set of numbers that gives coordinates to locate a point relative to each axis.

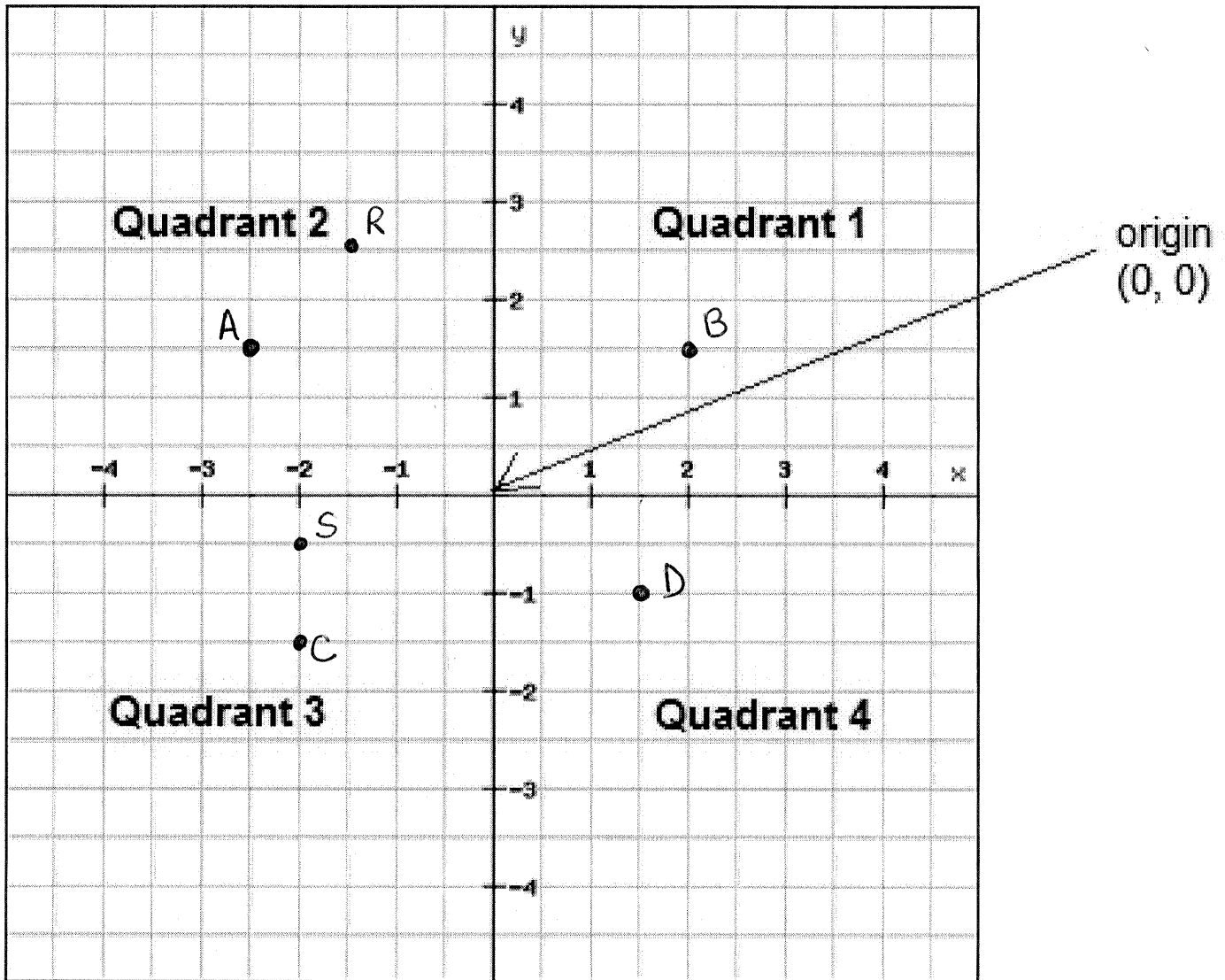
**Origin** –  $(0, 0)$

**To graph any point with coordinates  $(x, y)$ :**

1. Start at the origin  $(0, 0)$
2. Use the x-coordinate (the first number) to move right (if positive) or left (if negative) along the x-axis.
3. Then use the y-coordinate (the second number) of the point to move up (if positive) or down (if negative) following the y-axis.
4. Draw a point on the coordinate grid and label the point.



Topic 8.2: Rational Numbers on the Coordinate Plane



$$A(-2.5, 1.5)$$

$$B(2, 1.5)$$

$$C(-2, -1\frac{1}{2})$$

$$D(1\frac{1}{2}, -1)$$

$$R(-1.5, 2.5) \text{ or } (-1\frac{1}{2}, 2\frac{1}{2})$$

$$S(-2, -0.5) \text{ or } (-2, -\frac{1}{2})$$

### Topic 8.3: Distance on the Coordinate Plane

\*Use absolute value to help you determine distance traveled in units on the coordinate plane.

1. (-5, 2) and (-5, 6)

$$|2| - |6| = 4$$

4 units

2. (-3, 1) and (2, -1)

$$|-3| + |2| = 5$$

5 units

3. (4, -3) and (4, 5)

$$|-3| + |5| = 8$$

8 units

4. (0, -4) and (0, -1)

$$|-4| - |-1| = 3$$

3 units

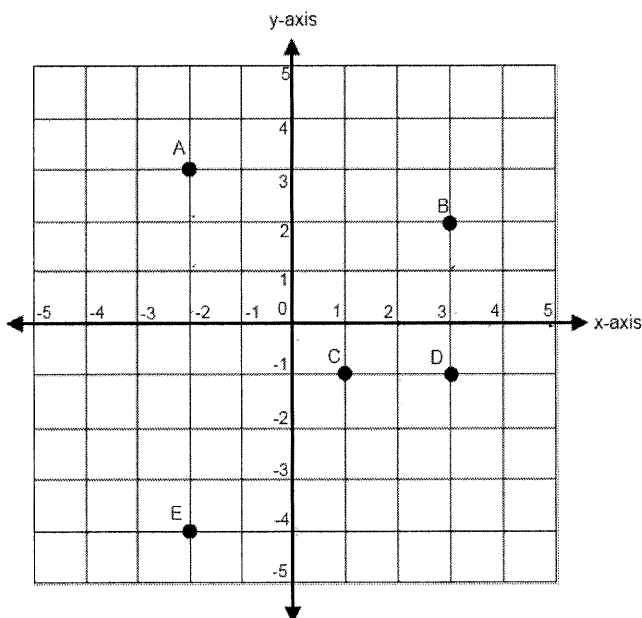
5. (5, -7) and (5, -1)

$$|-7| - |-1| = 6$$

6 units

★ When the points are in the same quadrant, you subtract the absolute values of the coordinates that are different.

★ When the points are in different quadrants, you add the absolute values of the coordinates that are different.



1. Distance from B to D.

~ 3 units

2. Distance from A to E.

~ 7 units

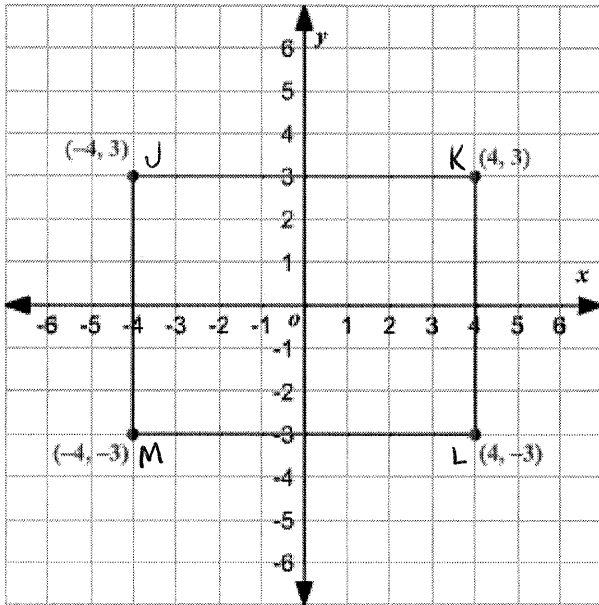
3. Distance from C to D.

~ 2 units

Topic 8.4: Polygons on the Coordinate Plane

\*Finding perimeter on the coordinate plane.

\*REMEMBER: Perimeter is the distance around a figure.

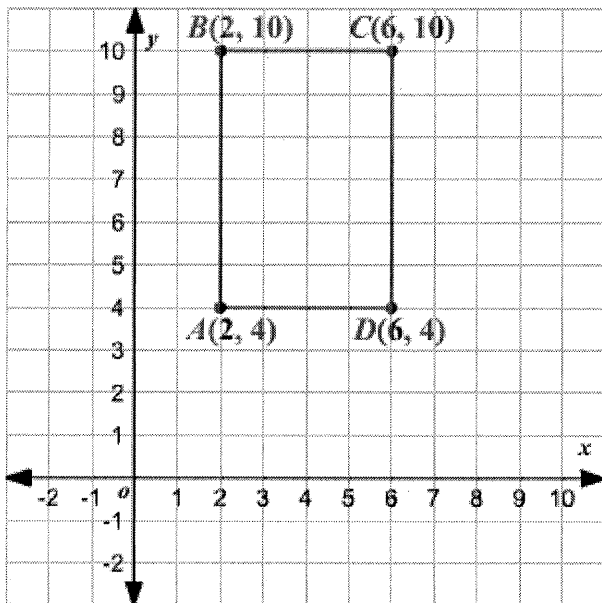


★ Rectangle JKLM

$$\begin{array}{ll} JK = 8 & KL = 6 \\ ML = 8 & JM = 6 \end{array}$$

$$8 + 8 + 6 + 6$$

Perimeter = 28 units



★ Rectangle BCDA

$$\begin{array}{ll} BC = 4 & CD = 6 \\ AD = 4 & BA = 6 \end{array}$$

$$4 + 4 + 6 + 6$$

Perimeter = 20 units

## Topic 8.5: Graphing Equations

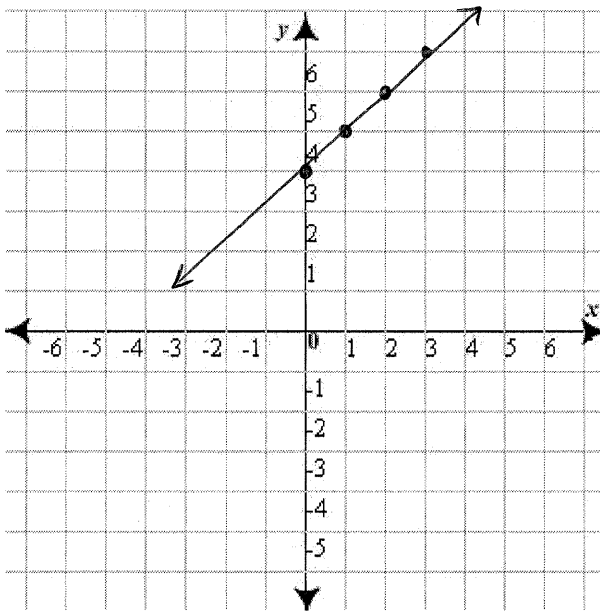
**T-Table** – a graph shaped like the capital letter “T” to help organize data.

**Linear equation** – when the graph of an equation creates a straight line on the coordinate plane.

### How to Graph a Linear Equation:

**Step 1:** Make a T-table for the equation. *Always choose at least 3 x-values; then find the corresponding y-values.*

**Step 2:** Graph each ordered pair in the T-table on a coordinate plane. *Use a straight edge to draw a line through the points.*

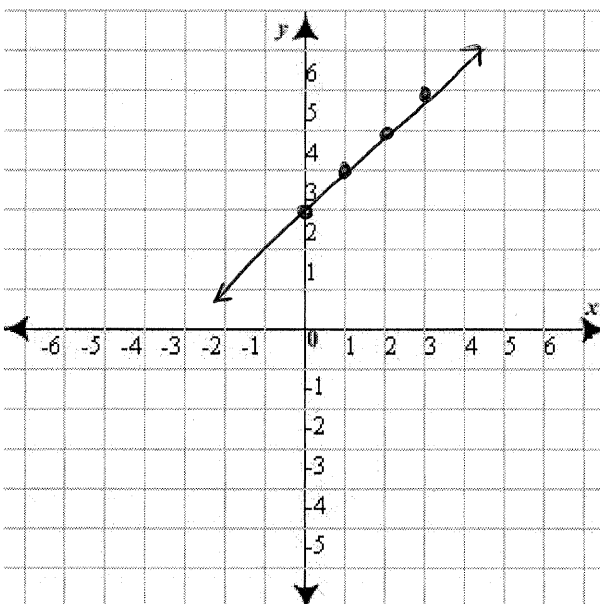


$$y = x + 4$$
$$y = 0 + 4$$
$$y = 4$$

$$y = x + 4$$
$$y = 1 + 4$$
$$y = 5$$

$$y = x + 4$$
$$y = 2 + 4$$
$$y = 6$$

x	y
0	4
1	5
2	6
3	7



$$y = 3 + x$$

x	y
0	3
1	4
2	5
3	6

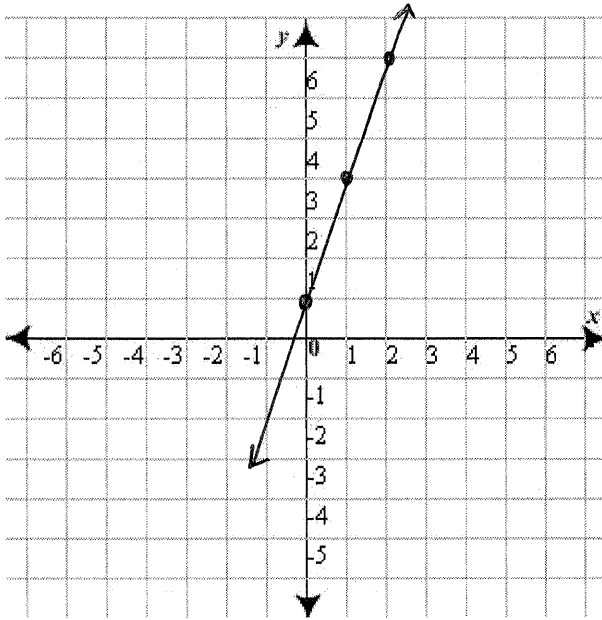
### Topic 8.6: More Graphing Equations

Graphing linear equations with two operations (two step equations).

**Step 1:** Make a T-table for the equation.

**Step 2:** Graph each ordered pair on a coordinate plane. Draw a line through the points.

**Step 3:** Use the graph to find the point of missing values as needed.



$$y = 3x + 1$$

$$y = 3(0) + 1$$

$$y = 1$$

$$y = 3x + 1$$

$$y = 3(1) + 1$$

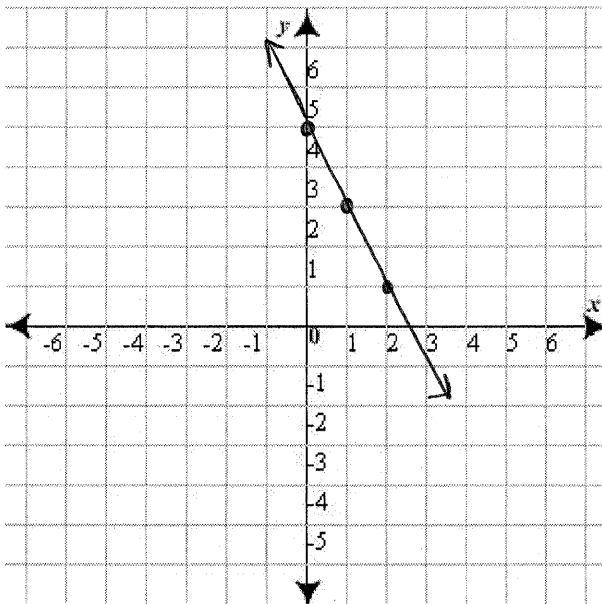
$$y = 4$$

$$y = 3x + 1$$

$$y = 3(2) + 1$$

$$y = 7$$

X	Y
0	1
1	4
2	7



$$y = 5 - 2x$$

$$y = 5 - 2(0)$$

$$y = 5$$

$$y = 5 - 2x$$

$$y = 5 - 2(1)$$

$$y = 3$$

$$y = 5 - 2x$$

$$y = 5 - 2(2)$$

$$y = 1$$

X	Y
0	5
1	3
2	1

Topic 8.7: Multiple-Step Problems

To solve these types of problems, you must first answer one or more hidden questions.

Remember these steps:

1. Organize the problem.
2. What do I know?
3. What am I asked to find?
4. Plan and Solve (answer hidden questions first).

A radio station has a daily vote. On Mondays, Wednesday, and Fridays, you have  $2\frac{2}{3}$  hours to vote. On Tuesdays and Thursday, you have  $1\frac{3}{4}$  hours. How many total hours in a week do you have to submit a vote?

I Know: M-W-F =  $2\frac{2}{3}$  hours  
 Tu-Th =  $1\frac{3}{4}$  hours

$$2\frac{2}{3} + 2\frac{2}{3} + 2\frac{2}{3} = 6\frac{6}{3}$$

$$1\frac{3}{4} + 1\frac{3}{4} = 2\frac{6}{4}$$

Find: total hours

$11\frac{1}{2}$  hours

$$3\frac{6}{12} = 3\frac{1}{2}$$

$$\begin{array}{r} 12 \overline{)42} \\ -36 \\ \hline 6 \end{array}$$

$$\begin{array}{r} 6\frac{6 \times 4}{3 \times 4} \quad \frac{24}{12} \\ + 2\frac{6 \times 3}{4 \times 3} \quad \frac{18}{12} \\ \hline 8\frac{42}{12} \rightarrow 11\frac{1}{2} \end{array}$$

Baseball tickets cost \$12.25 for adults and \$8.75 for children under 13. Carlos' father took Carlos and three of his friends to the game. If Carlos and his friends are under 13, what was the total cost for the tickets?

I Know: \$12.25 adults  
 \$8.75 children

1 adult @ 12.25  
 4 children @ 8.75

Find: total cost

\$47.25

$$\begin{array}{r} 3 \quad 2 \\ 8.75 \\ \times \quad 4 \\ \hline 35.00 \end{array} \quad \begin{array}{r} 35.00 \\ + 12.25 \\ \hline \$47.25 \end{array}$$