

10 The Coordinate Plane

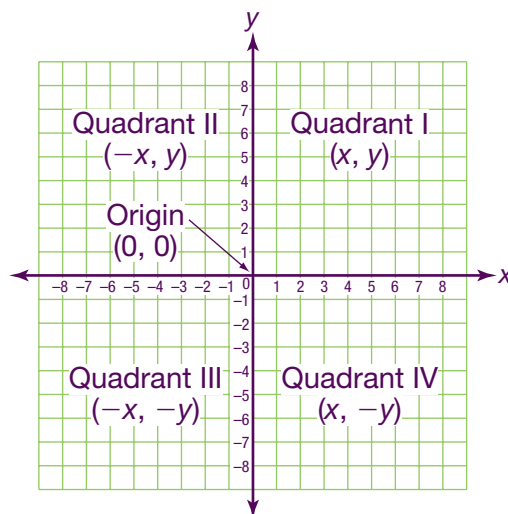
Key Words

coordinate plane
ordered pair
origin
x-axis
x-coordinate
y-axis
y-coordinate

The **coordinate plane** is a system of two intersecting number lines. The **x-axis** is the horizontal number line. The **y-axis** is the vertical number line. The x- and y-axes intersect at a point called the **origin**.

An **ordered pair** is a pair of numbers (x, y) that describes the location of a point on the coordinate plane. The first number in an ordered pair is the **x-coordinate**. It tells how far right or left the point is from 0 on the x-axis. The second number is the **y-coordinate**. It tells how far up or down the point is from 0 on the y-axis.

The signs of the numbers in an ordered pair tell which quadrant the point is in.



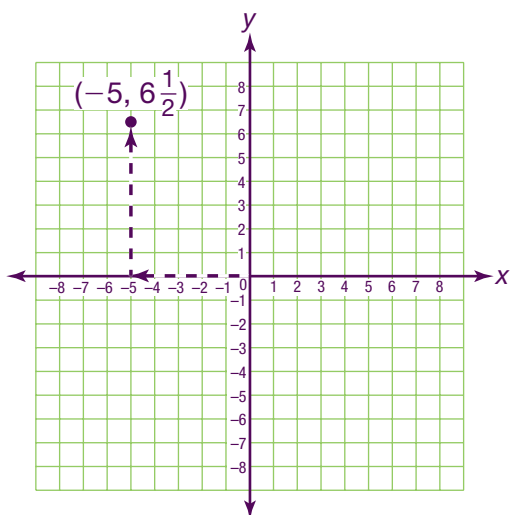
Example

In which quadrant does $(-5, 6\frac{1}{2})$ lie? Plot it on a coordinate plane.

The x-coordinate -5 is negative. It tells that the point is 5 units left from 0 on the x-axis.

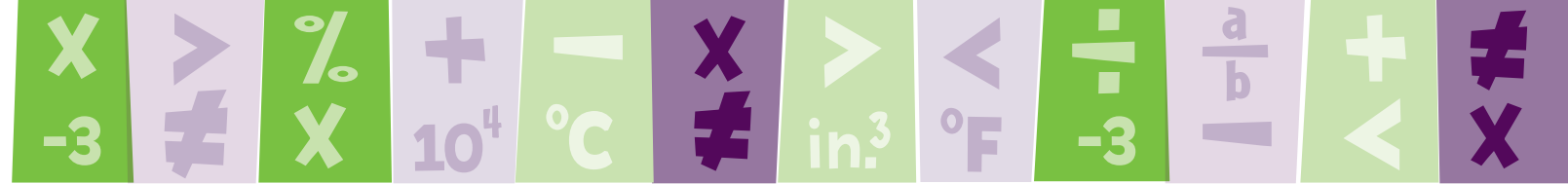
The y-coordinate $6\frac{1}{2}$ is positive. It tells that the point is $6\frac{1}{2}$ units up from 0 on the y-axis.

The point located at $(-5, 6\frac{1}{2})$ is in Quadrant II. The point is plotted in the coordinate grid below.



EXPLAIN

The points $(3, 4)$ and $(-3, 4)$ are plotted on a coordinate plane. How are the points related by their locations?



Guided Practice

1 In which quadrant does $(-4, -9\frac{1}{4})$ lie? ←

Step 1 Identify the x - and y -coordinates.

The x -coordinate is _____.

The sign of the x -coordinate is _____.

The y -coordinate is _____. The sign of the y -coordinate is _____.

Step 2 Identify the point's quadrant.

A point with a negative x -coordinate and a negative y -coordinate lies in Quadrant _____.

$(-4, -9\frac{1}{4})$ lies in Quadrant _____.

REMEMBER

Just as x comes before y in the alphabet, the x -coordinate comes before the y -coordinate in an ordered pair.

2 What is the ordered pair for point A on the coordinate plane?

Step 1 Count how many units right or left from 0 the point lies on the x -axis.

Point A is _____ units to the _____ of 0 on the x -axis.

So, the x -coordinate is _____.

Step 2 Count how many units up or down from 0 the point lies on the y -axis.

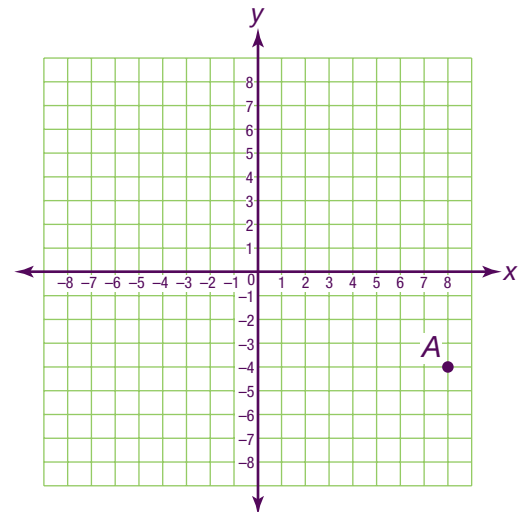
Point A is _____ units below 0 on the y -axis. ←

So, the y -coordinate is _____.

Step 3 Write the ordered pair.

(____, ____)

The ordered pair for point A is _____.



REMEMBER

Points below 0 on the y -axis are negative.