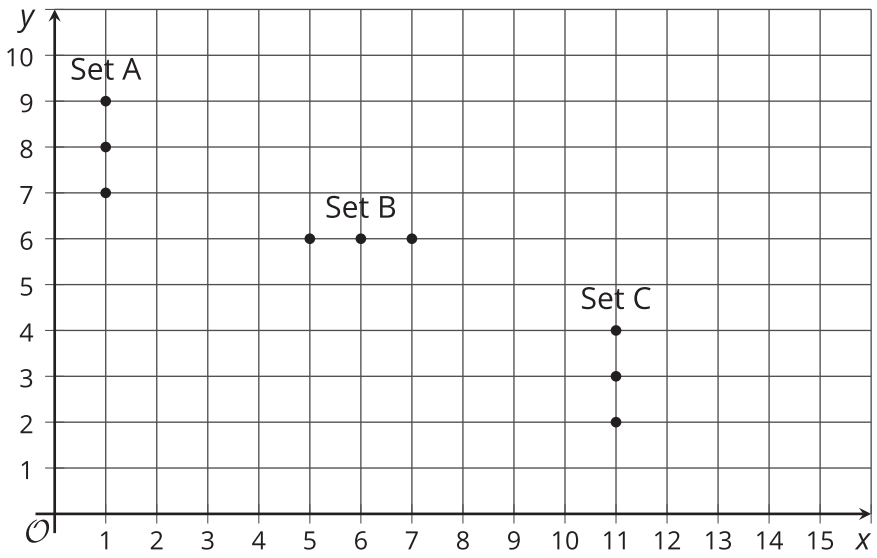
Unit 7, Lesson 11

# Points in the Coordinate Plane

Let's explore the coordinate plane.

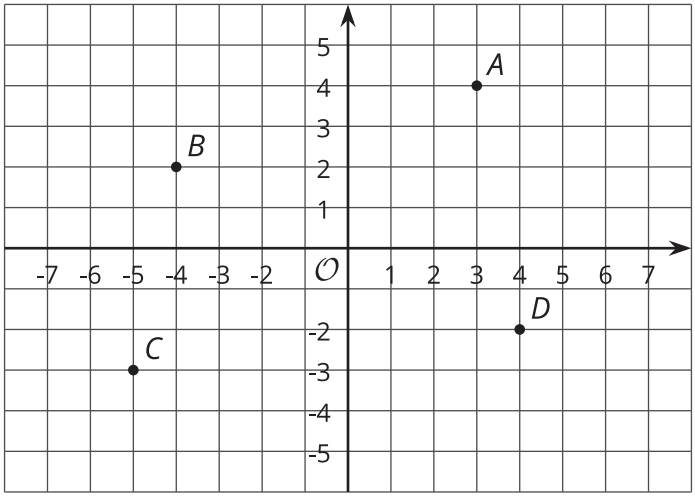
## 11.1 Guess My Line

Choose 1 set of points, and write the coordinates of each of the 3 points in the set. What do you notice about the coordinates?



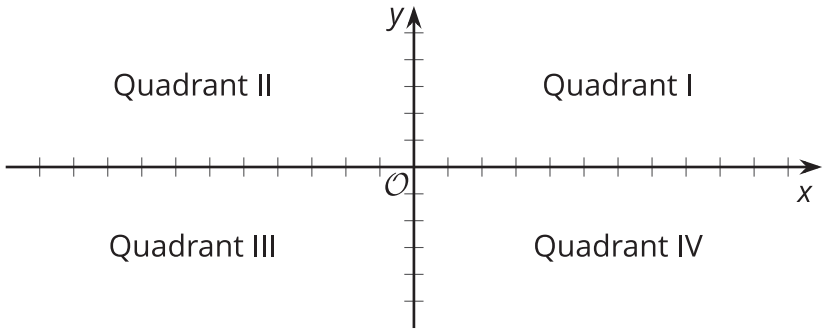
# 11.2 The Coordinate Plane

1. Write the coordinates of each labeled point.




2. Plot a point at $(-2, 5)$. Label it $E$.
3. Plot another point at $(3, -4.5)$. Label it $F$.
4. The **coordinate plane** is divided into four **quadrants**: I, II, III, and IV, as shown here.

   In which quadrant is point $G$ located? Point $H$? Point $I$?




$G\ (5, 2)$

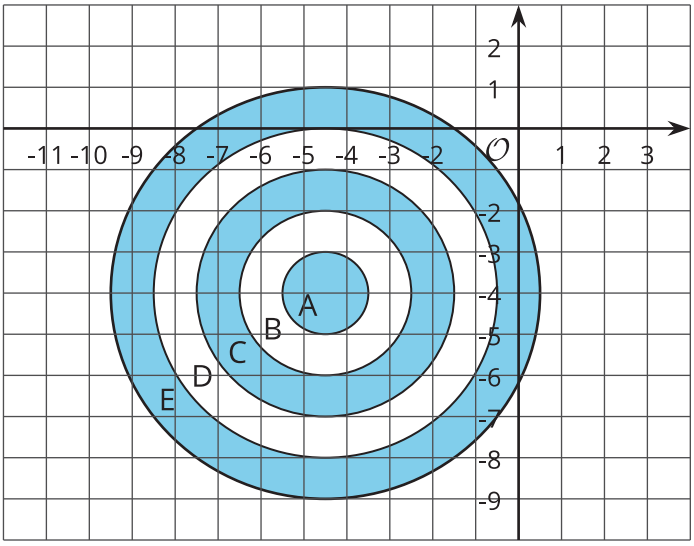
$H\ (-1, -5)$

$I\ (7, -4)$

5. If a point has a positive $y$-coordinate, in which quadrants could it be?

# 11.3 Coordinated Archery

Here is an image of an archery target on a coordinate grid. The scores for landing an arrow in each of the regions are shown.




- A: 10 points
- B: 8 points
- C: 6 points
- D: 4 points
- E: 2 points

Name the possible coordinates of where one arrow could land to earn each of the following scores:

1. 6 points

2. 10 points

3. 2 points

4. no points

5. 4 points

6. 8 points

## Are you ready for more?

Pretend you are stuck in a coordinate plane. You can only take vertical and horizontal steps that are one unit long.

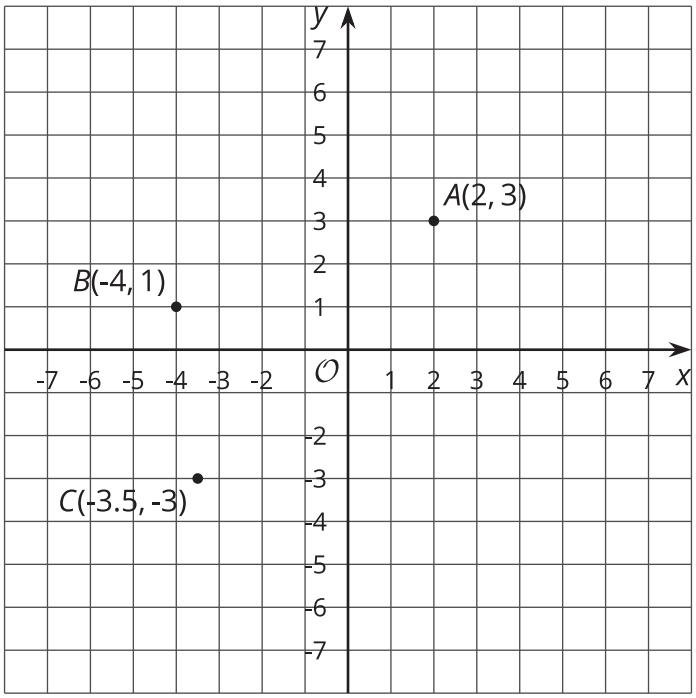
1. How many ways are there to get from the point $(-3, 2)$ to $(-1, -1)$ if you will only step down and to the right?

2. How many ways are there to get from the point $(-1, -2)$ to $(4, 0)$ if you can only step up and to the right?

3. Make up some more problems like this and see what patterns you notice.

## Lesson 11 Summary

Just as the number line can be extended to the left to include negative numbers, the $x$- and $y$-axes can also be extended to include negative values. This creates the **coordinate plane**, a system that can be used to describe the locations of points.




For example, point $B$ can be described by the ordered pair $(-4, 1)$. The $x$-value of -4 tells us that the point is 4 units to the left of the $y$-axis. The $y$-value of 1 tells us that the point is 1 unit above the $x$-axis. Point $B$ is located in Quadrant II.

The same reasoning applies to the points $A$ and $C$. The $x$- and $y$-coordinates for point $A$ are positive, so $A$ is to the right of the $y$-axis and above the $x$-axis. Point $A$ is located in Quadrant I.

The $x$- and $y$-coordinates for point $C$ are negative, so $C$ is to the left of the $y$-axis and below the $x$-axis. Point $C$ is located in Quadrant III.

Quadrant IV contains points whose $x$-coordinates are positive and whose $y$-coordinates are negative.