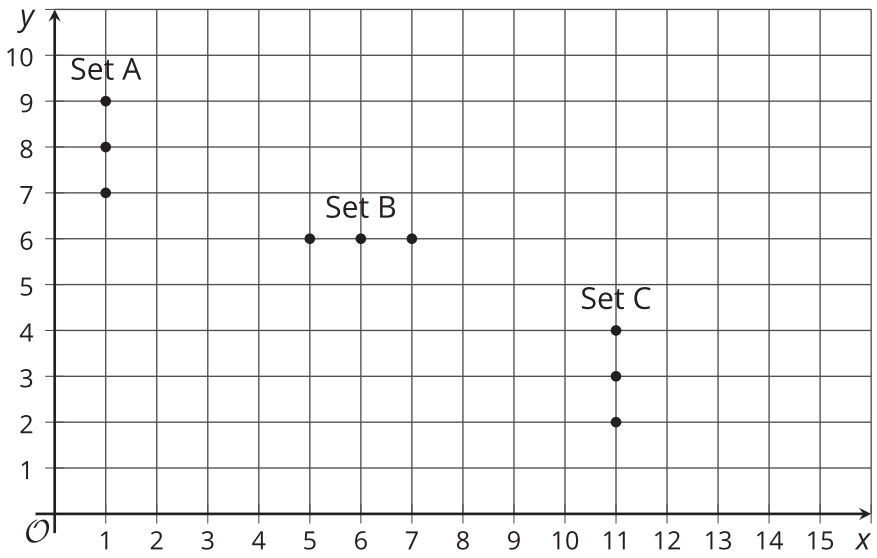
Unit 7, Lesson 11

Points in the Coordinate Plane

Let's explore the coordinate plane.

11.1 Guess My Line

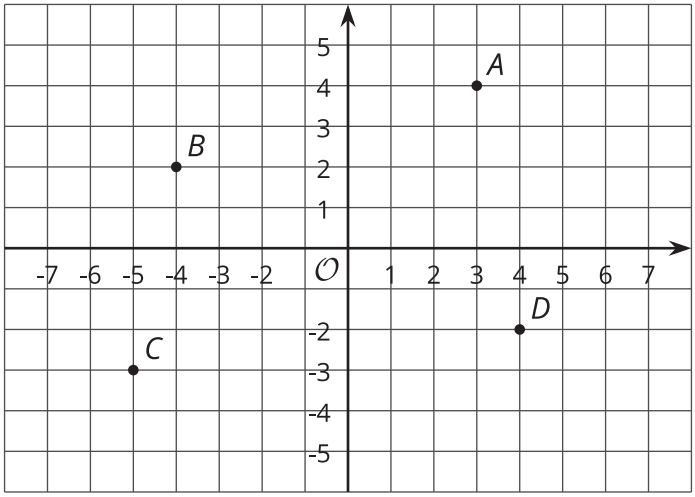
Choose 1 set of points, and write the coordinates of each of the 3 points in the set. What do you notice about the coordinates?



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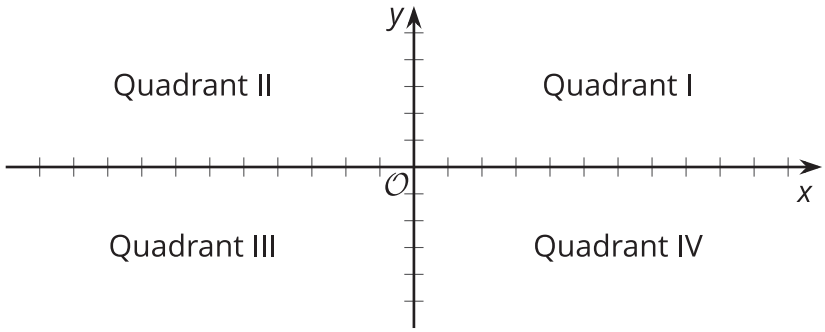
11.2 The Coordinate Plane

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?



$G\ (5, 2)$

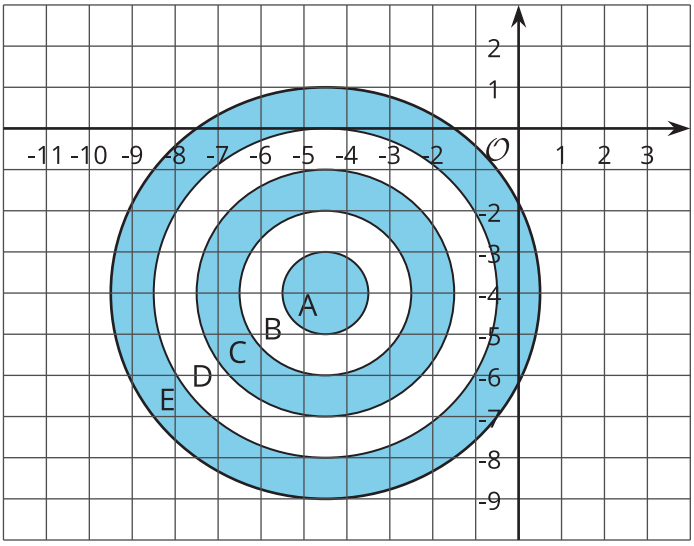
$H\ (-1, -5)$

$I\ (7, -4)$

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?

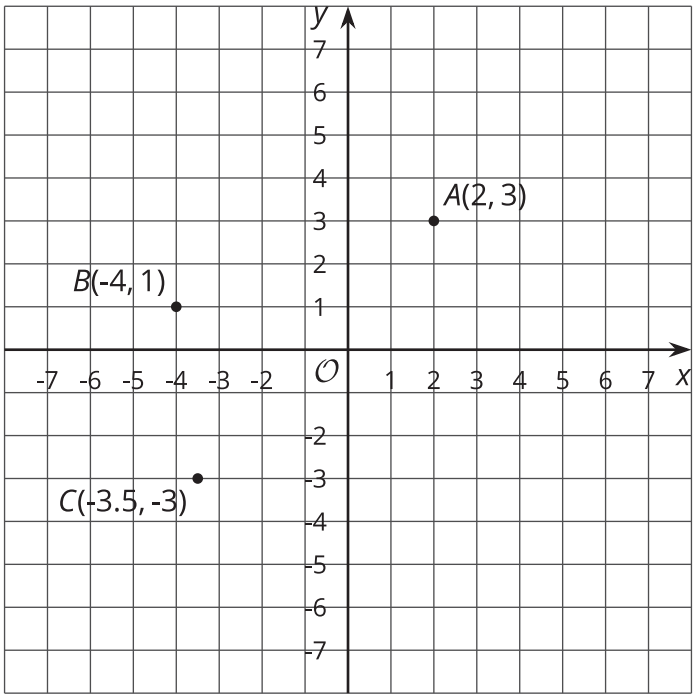
2. How many ways are there to get from the point $(-1, -2)$ to $(4, 0)$ if you can only step up and to the right?

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

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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.