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Unit 7, Lesson 14

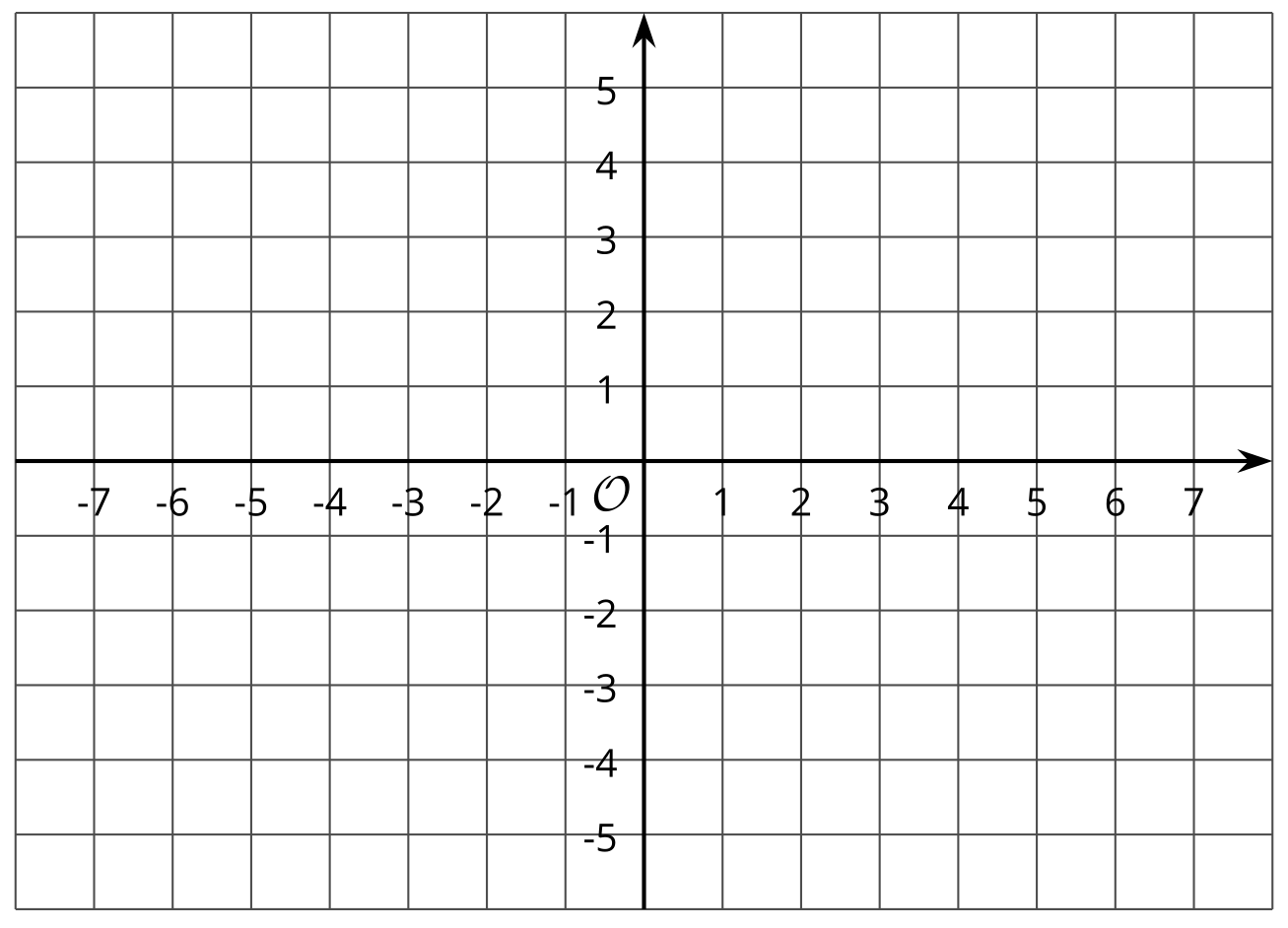
# Distances in the Coordinate Plane

Let’s explore distance on the coordinate plane.

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## 14.1Coordinate Patterns

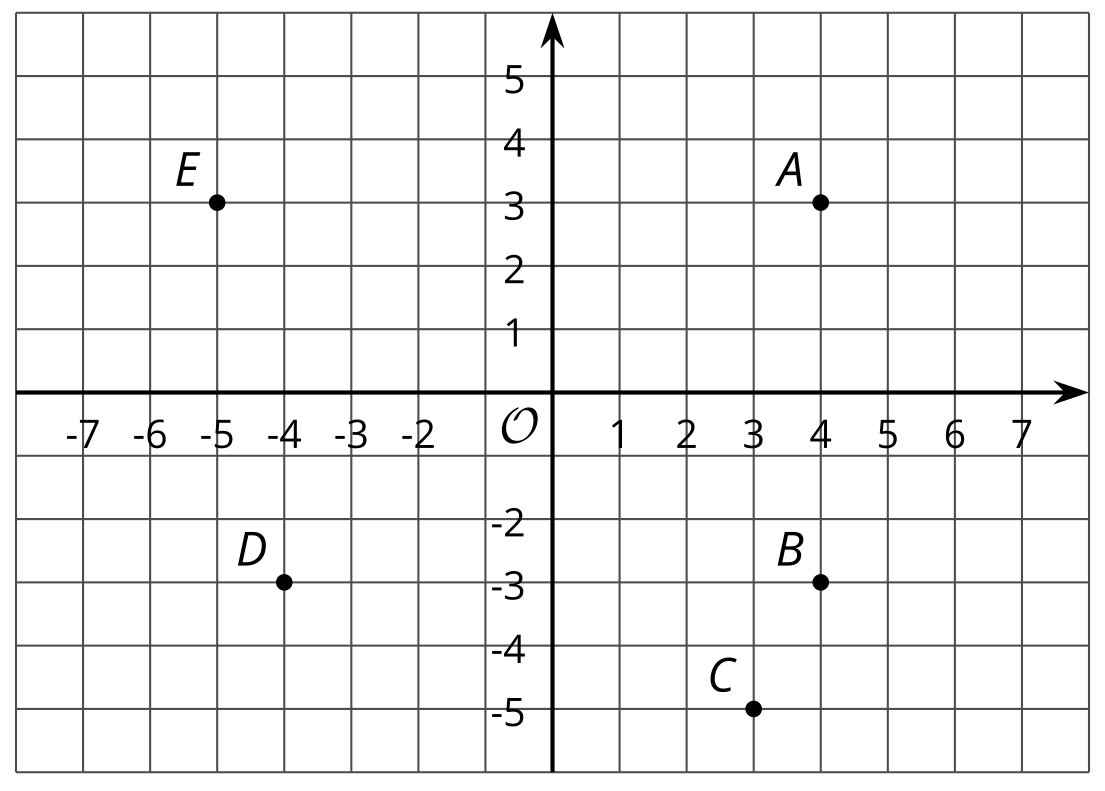
Plot at least 3 points in your assigned quadrant, and label them with their coordinates.



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## 14.2Signs of Numbers in Coordinates

1. Write the coordinates of each point.

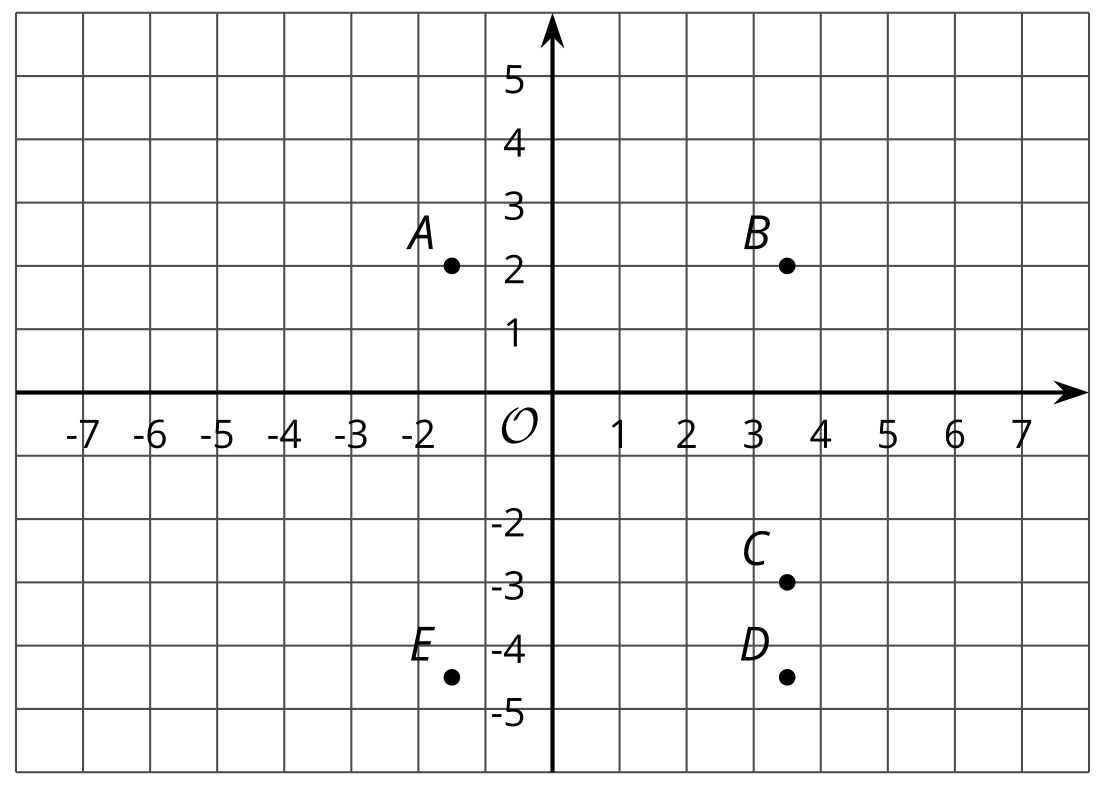
* 

1. Answer these questions for each pair of points.
   * How are the coordinates the same? How are they different?
   * How far away are they from the -axis? To the left or to the right of it?
   * How far away are they from the -axis? Above or below it?
   1. and
   2. and
   3. and
2. Point has the same coordinates as point , except its -coordinate has the opposite sign.
   1. Plot point in the coordinate plane, and label it with its coordinates.
   2. How far away are and from the -axis?
3. Point has the same coordinates as point , except its -coordinate has the opposite sign.
   1. Plot point in the coordinate plane, and label it with its coordinates.
   2. How far away are and from the -axis?
4. Point has the same coordinates as point , except both coordinates have opposite signs. In which quadrant is point ?

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## 14.3Finding Distances in a Coordinate Plane

1. Label each point with its coordinates.

* 

1. Find the distance between each pair of points.
   1. Points and
   2. Points and
   3. Points and
2. Which of the points are 5 units from ?
3. Which of the points are 2 units from ?
4. Plot a point that is both 2.5 units from and 9 units from . Label that point , and write down its coordinates.

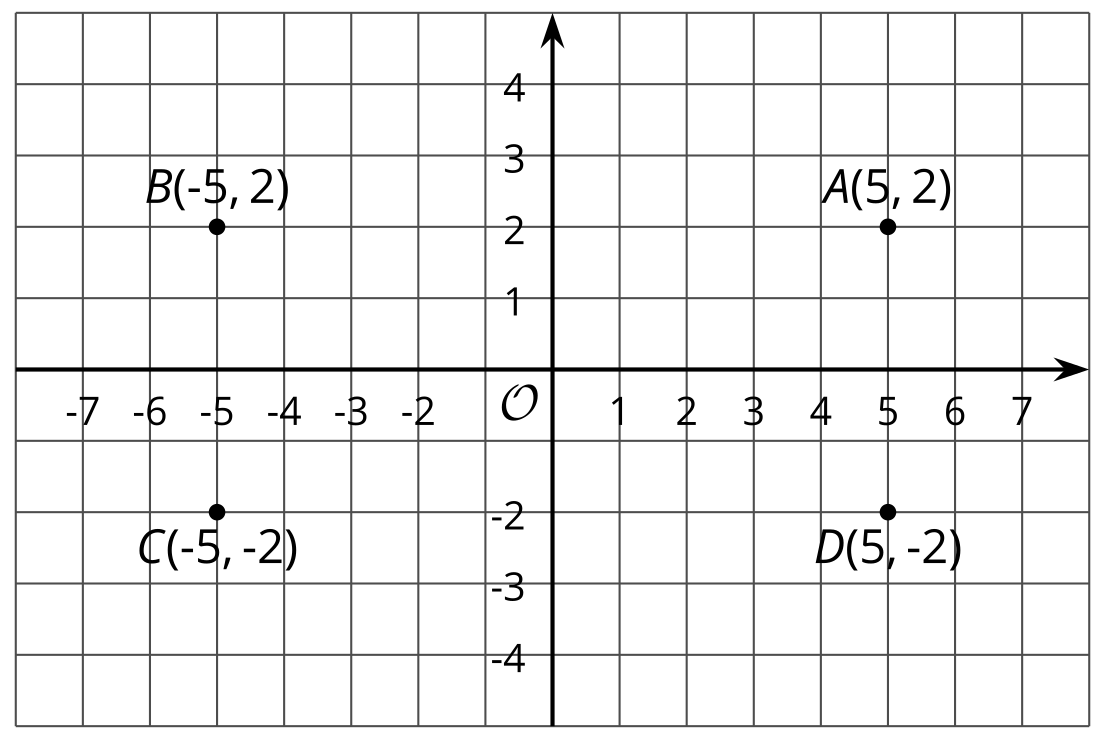
### Are you ready for more?

Priya says, “There are exactly four points that are 3 units away from .” Lin says, “I think there are a whole bunch of points that are 3 units away from .”

Do you agree with either of them? Explain your reasoning.

## Lesson 14 Summary

The points , and  are shown in the coordinate plane. Notice that they all have almost the same coordinates, except the signs are different. They are all the same distance from each axis but are in different quadrants.



Notice that the vertical distance between points and is 4 units because point is 2 units above the horizontal axis and point is 2 units below the horizontal axis. The horizontal distance between points and is 10 units because point is 5 units to the left of the vertical axis and point is 5 units to the right of the vertical axis.

We can always tell which quadrant a point is located in by the signs of its coordinates.

|  |  | quadrant |
| --- | --- | --- |
| positive | positive | I |
| negative | positive | II |
| negative | negative | III |
| positive | negative | IV |

