

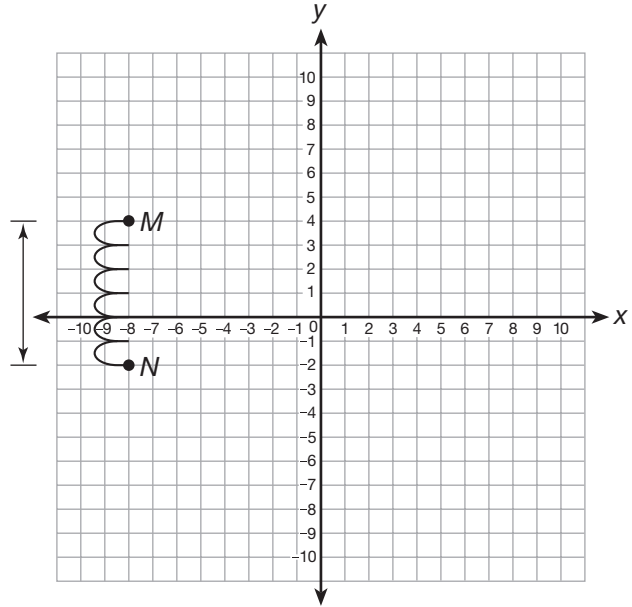
Lesson 26: Coordinate Geometry

You can use a coordinate plane to determine the distance between two points with the same x - or y -coordinate.

Example

What is the distance between points M and N in the coordinate plane?

You can count the spaces between point M and point N . The distance between the points is 6.



You can also use absolute value to find the distance between two points. The distance between two points is the absolute value of the difference between the coordinates that are different. The distance between the points (a, b) and (c, b) is $|a - c|$. The distance between the points (a, b) and (a, c) is $|b - c|$.

Example

What is the distance between $J(-7, 1)$ and $K(-4, 1)$?

Points J and K have the same y -coordinate. To find the distance between the points, find the absolute value of the difference of their x -coordinates.

$$|-7 - (-4)| = |-7 + 4| = |-3| = 3$$

The distance between J and K is 3.

Example

What is the distance between $R(-3, 4)$ and $S(8, 4)$?

Points R and S have the same y -coordinate. To find the distance between the points, find the absolute value of the difference of their x -coordinates.

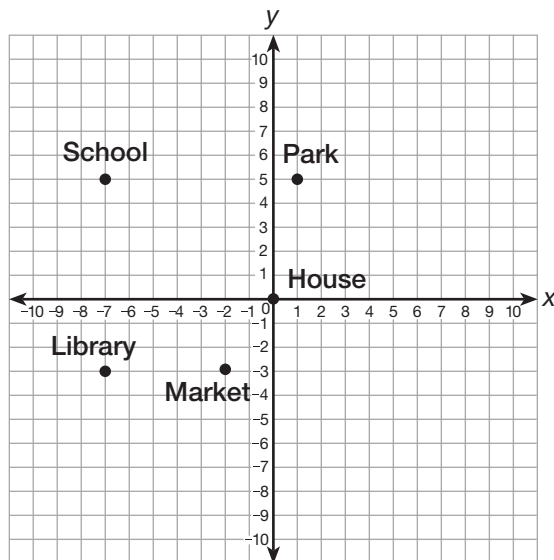
$$|-3 - 8| = |-11| = 11$$

The distance between R and S is 11.

Maps have coordinates so that you can find locations easily.

▶ Example

Willy makes a map to show the neighborhood around his house. Each unit on the plane represents a city block. He maps the locations of his house, school, library, favorite park, and local market. What is the distance from the library to the market?



To find the distance between the points, you can count the number of units along the x-axis between them. You can also find the absolute value of the difference between the x-coordinates.

$$|-7 - (-2)| = |-7 + 2| = |-5| = 5$$

The distance from the library to the market is 5 city blocks.

▶ Example

What is the distance from Willy's school to the library?

To find the distance between the points, you can count the number of units along the y-axis between them. You can also find the absolute value of the difference between the y-coordinates.

$$\begin{aligned} |5 - (-3)| &= |5 + 3| \\ &= |8| \\ &= 8 \end{aligned}$$

The distance from Willy's school to the library is 8 city blocks.