

Lesson 2-5: Find Distances on the Coordinate Plane

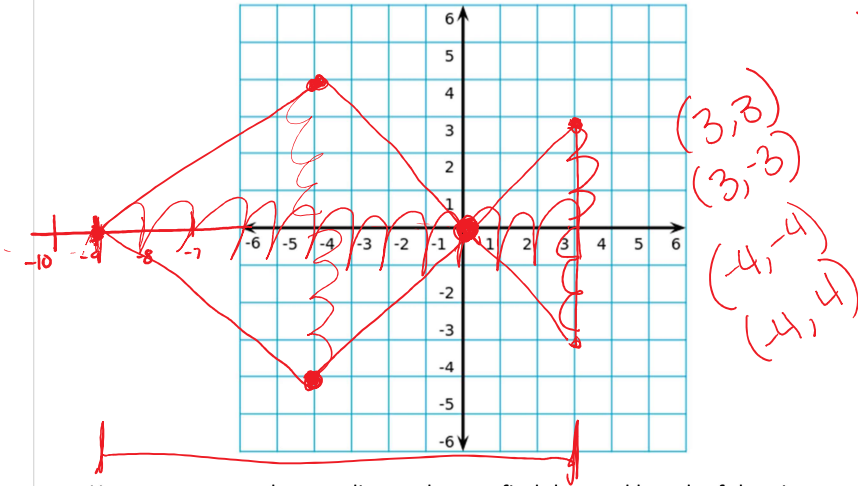
I can...use absolute value to find distance on a coordinate plane.

Solve it & Discuss it!

Graph the points on the coordinate plane below. What picture do you make when you connect the points in order?

(3, 3), (0, 0), (-4, -4), (-9, 0), (-4, 4), (0, 0), (3, -3), (3, 3) *Fish*

Name a pair of the points that are the same distance from the x-axis. Explain your choice.



How can you use the coordinate plane to find the total length of the picture you graphed?

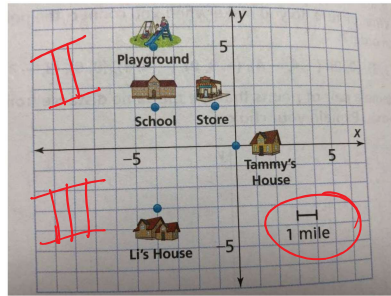
can't = 12 units
9 + 3 = 12 units

Example 1: Find Vertical Distance (same x-coordinate)

Tammy drew a map of her neighborhood. How far is it from Li's house to school?

count spaces
5 miles

~~(-4, -3)~~ ~~(-4, 2)~~
|-3| + |2|



Same quadrant = subtract

$$d = \sqrt{(x^2 - x^1)^2 + (y^2 - y^1)^2}$$

3 + 2 = 5 miles different quadrant = add

Try it!

What is the distance from the school to the playground? Explain how you used absolute values to find the distance.

3 miles ~~(-4, 5)~~ ~~(-4, 2)~~
|5| - |2| = 3

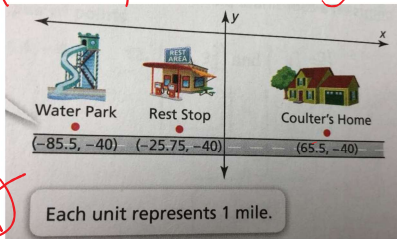
Convince me!

To find the distance from the school to the playground, do you add or subtract the absolute values of the y-coordinates? Explain.

Subtract
Same quadrant

Example 2: Find Horizontal Distance (same y-coordinate)

The Colter family starts at their home and stops at a rest stop to eat lunch. How much farther do they need to drive to get to the water park? Use the coordinates to find the distance.



~~(-85.5, -40)~~ ~~(-25.75, -40)~~
|-85.5| - |-25.75|

Try it! 85.5 - 25.75 = 59.75 miles

What is the total distance of the Colter's return trip after their day at the water park?

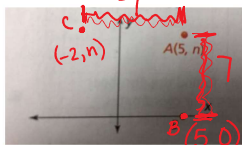
~~(-85.5, -40)~~ ~~(65.5, -40)~~
|-85.5| + |65.5| = 151 miles

Example 3: Solve Problems using Distance.

Point B is on the x-axis and has the same x-coordinate as point A. Point C is graphed at (-2, n). The distance from point A to point C is equal to the distance from point A to point B.

What is the value of n?

A ~~(5, 7)~~ C ~~(-2, n)~~
|5| + |-2| = 7
|n - 7|



~~(5, 0)~~ ~~(-2, 0)~~
 $|5| + |-2| = 7$



$n = 7$

Try it!

Point D is in Quadrant IV and is the same distance from point B as point A. What are the coordinates of point D?

Do you understand?

1.) How can you find the distance between two points on a coordinate plane?

const *Ab. value* *add or subtract*

2.) To find the distance between two points using their coordinates, when you add their absolute values and when do you subtract them?

Same quadrant = sub.
different quadrant = add.

Rate your understanding. 1-Do not understand...4-can teach someone else

Learning target: Find the distance between point in a coordinate plane.	1	2	3	4
I can find distances between points in a coordinate plane with the same x-coordinates or the same y-coordinates.	1	2	3	4
I can find horizontal and vertical side lengths in a coordinate plane.	1	2	3	4