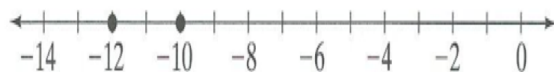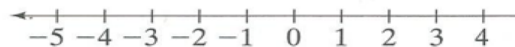# Finding Distance Between Points

I can find distances between points with the same first coordinate or the same second coordinate using absolute value

1. Since -12 is to the left of -10 on the number line, -12 is _____ -10.

-14 -12 -10 -8 -6 -4 -2 0

a. >
b. <
c. =
d. the opposite of

2. Since 3 is to the right of -5 on the number line, 3 is _____ -5.

-5 -4 -3 -2 -1 0 1 2 3 4

a. >
b. <
c. =
d. the opposite of

3. The lowest temperatures ever recorded on earth's continents are shown below. What continent has a lower recorded temperature than Asia?

Continent	S.America	N.America	Antarctica	Europe	Asia
Temperature	-39	-66.1	-89.2	-58.1	-68

a. N. America
b. Antarctica
c. Europe
d. S. America

4. Brian is going diving. Sea level is 0 feet. His guide is on a deck five feet above sea level. Brian is 10 feet below the surface. What is the **distance** between Brian and his guide?

a. 10 feet
b. 5 feet
c. 0 feet
d. 15 feet

Today, we are going to use the coordinate plane to find distances between points when either the first coordinate or the second coordinate is the same.

If the points lie in the same quadrant, subtract the absolute values of the appropriate coordinates.

If the points lie in different quadrants, add the absolute value of the appropriate coordinates.

Example One

Find the distance between the pair of points.
(-3, 1) and (2, 1)

The quadrants are different, so what are we going to do to the absolute values?   *Add*

Horizontal distance from (-3, 1) to the y-axis: $|\underline{\ ^{-3}\ }|$ = 3

Horizontal distance from (2, 1) to y – axis: $|\underline{\ 2\ }|$ = 2

Distance from (-3, 1) to (2, 1) is 3 + 2 = 5

Example Two

Find the distance between the pair of points.
(-3, 3) and (-3, 1)

The quadrants are the sam3. So what are we going to do to the absolute values' **Subtract**

Horizontal distance from (-3, 3) to the y-axis:| **3** | = **3** __

Horizontal distance from (-3, 1) to y – axis: | **1** | = **1** __

Distance from (-3, 1) to (2, 1) is **3** + **1** = **4**

Welcome to Coordinateville.

The coordinate grid you have, is the city lay out.

The following places are placed at the given coordinates.

Today we will map out the city and find the distances each places are away from each other.

Sarah lives in a house at point (3, -2)
Her best friend Leigh Ann lives at (7,-2)

How many blocks apart from each other do they live?

First We plot each point.
Plot (3,-2) for sarah's House
Plot (7,-2) for Leigh Ann's House
Use absolute value to find the
distance between the houses.

|7| - |3| = 4 units

Morgan lives in a house at point (4, 10)
He decides to go for ice cream and the ice cream shop is located at (4, -1)
How many blocks are between Morgan's house and the ice cream shop?

First We plot each point.
Plot (4,10) for Morgan's House
Plot (4,-1) for the Ice Cream Shop.
Use absolute value to find the distance.

$$|10| - |-1| = 11 \text{ units}$$

The Middle School is located at (3, 2)
The City Park is located at (3, 8)
How many blocks are between the Middle School and the City Park?

First we plot each point.
Plot (3, 2) for the middle school
Plot (3, 8) for the city park
Use absolute value to find the distance.

|8| - |2| = 6 units

The Fire Department is located at (8, -5)
The Police Department is located at (-2, -5)
How many blocks are between the Fire Department and the Police Department?

The Grocery Store is located at (4, -8)
The Jewelry Store is located at (-3, -8)
How many blocks are between the grocery store and the jewelry store?

The City Hall is located at
(-2, 6)
The Gas Station is located
at (-2, -10)
How many blocks are
between the City Hall and the
Gas Station?

Now, Try it on your own!
create **two** more places the town needs. (make sure that they have the **same x** or the **same** y coordinate)
Find how far apart those two places are.

Time for an Exit Slip!
Perform the same process that we did in class today, for the situations that your exit sips represent!

1. Which of the following best represents the distance between point *L* and point *M* on the number line below?

a. ¼ unit
b. ¾ unit
c. 1 ¼ unit
d. 1 ¾ unit

2. Find the distance between the two points. (-4, 1), (-4, 6)

a. 7
b. 5
c. 4
d. 0

3. Find the distance between the two points. (3, 5), (-1, 5)

a. 4
b. 2
c. 3
d. 5

4. Find the distance between two points. (-1, -3), (-1, 4)

a. 7
b. 5
c. 4
d. 3

5. Using the number line below, what is the distance between point *A* and point *B*?

a. 2
b. 2 ⅔
c. 2 ⅓
d. 3