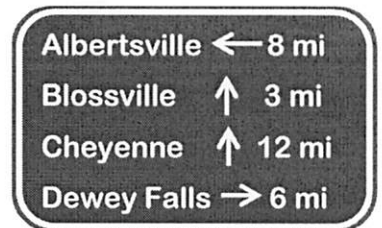"I Can Find the Vertical or Horizontal Distance Between two points on the Coordinate Plane."

"I Can Explain how Changing the Sign of the Numbers in an Ordered Pair Causes it to Reflect on One or Both Axes."

Distance Between Points and Reflections on the Coordinate Plane

Four friends are touring on motor cycles. They come to an intersection of two roads; the road they are on continues straight, and the other is perpendicular to it. The sign at the intersection shows the distances to several towns.

Albertsville ← 8 mi
Blossville ↑ 3 mi
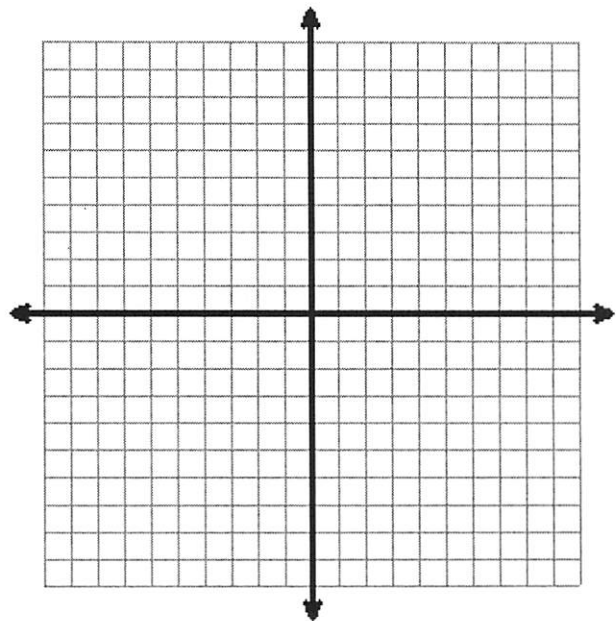Cheyenne ↑ 12 mi
Dewey Falls → 6 mi

What is the distance between Albertsville and Dewey Falls?

What is the distance between Blossville and Cheyenne?

Find the distance between the points listed below.

   a) (-3, 4) and (-3, 9)

   b) (2, -2) and (-8, -2)

   c) (-6, -6) and (-6, 1)
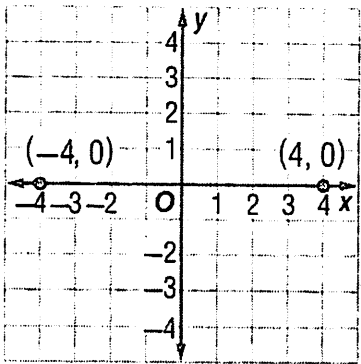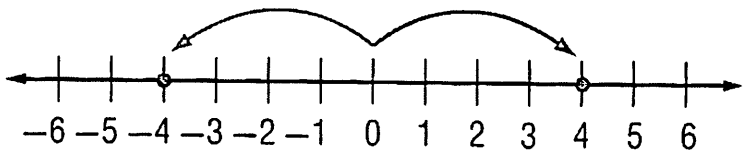
   d) (-9, 4) and (-4, 4)

   e) (0, -10) and (0, 8)

Without graphing, how can you determine the distance between the following sets of points?

   f) (32, 7) and (45, 7)   g) (-16, -102) and (-16, 8)   h) (17, -14) and (17, -65)

You can use what you know about number lines and opposites to compare locations on the coordinate plane. Consider the number line and coordinate plane below.

**The number line shows that -4 and 4 are opposites**.

The coordinate plane shows that the points (-4, 0) and (4, 0) are the same distance from the *y*-axis in opposite directions. So, they are *reflected* across the *y*-axis. Notice that the *y*- coordinates did not change and that the *x*-coordinates are opposites.

Name the ordered pair that is a reflection of each point across the *x*-axis.

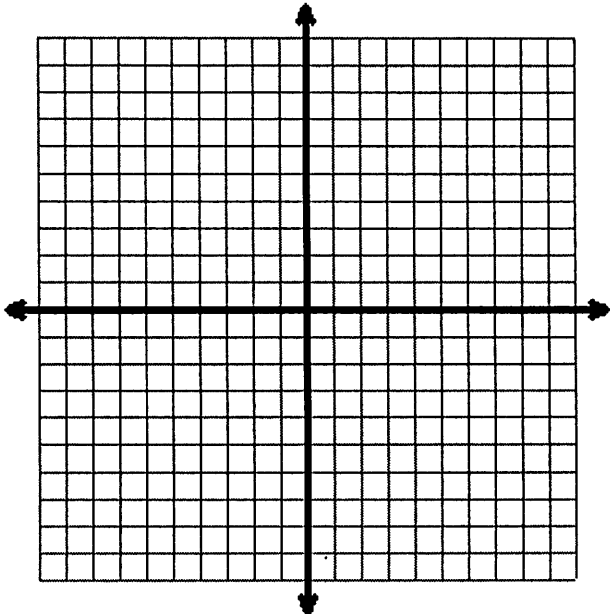(1, -4)   (-2, 5)   (-3, -1)

Name the ordered pair that is a reflection of each point across the *y*-axis.
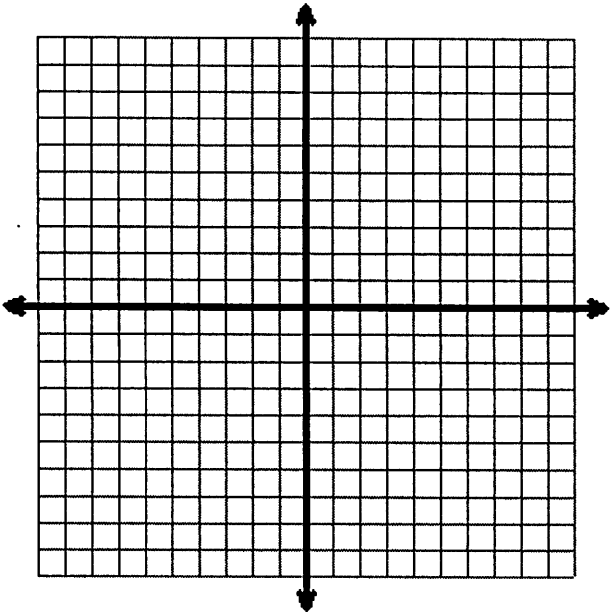
(1, -4)   (-2, 5)   (-3, -1)

In each column, write the coordinates of the points that are related to the given point by the criteria listed in the first column of the table.

Given Point	(5, 3)	(-2, 4)	(3, -2)	(-1, -5)
Reflected across the *y-axis*				
Reflected across the *x-axis*				
Reflected first across the *y-axis* and then *the x-axis*				
Reflected first across the *x-axis* and then *the y-axis*				

"I Can Find the Vertical or Horizontal Distance Between two points on the Coordinate Plane."

"I Can Explain how Changing the Sign of the Numbers in an Ordered Pair Causes it to Reflect on One or Both Axes."

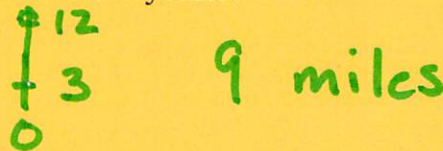# Distance Between Points and Reflections on the Coordinate Plane

Four friends are touring on motor cycles. They come to an intersection of two roads; the road they are on continues straight, and the other is perpendicular to it. The sign at the intersection shows the distances to several towns.

Albertsville	← 8 mi
Blossville	↑ 3 mi
Cheyenne	↑ 12 mi
Dewey Falls	→ 6 mi

What is the distance between Albertsville and Dewey Falls?

8 ←——+——→ 6   **14 miles**

What is the distance between Blossville and Cheyenne?

↑ 12
+ 3   **9 miles**
0

Find the distance between the points listed below.

a) (-3, 4) and (-3, 9)

5 units

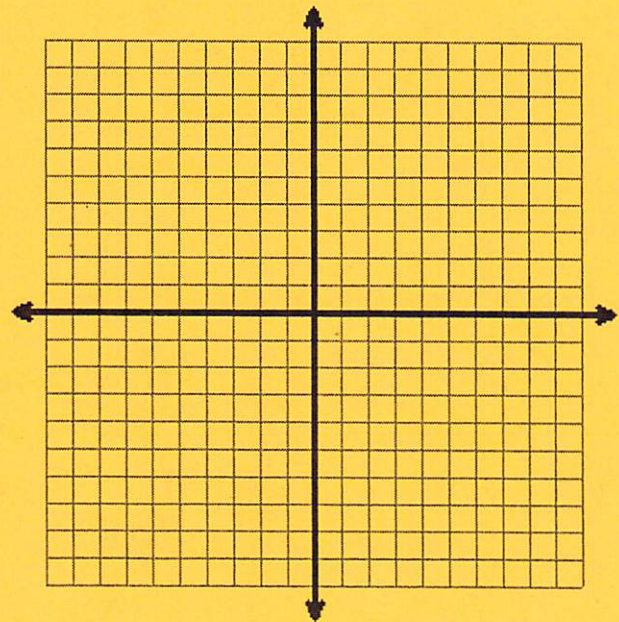b) (2, -2) and (-8, -2)

10 units

c) (-6, -6) and (-6, 1)

7 units

d) (-9, 4) and (-4, 4)

5 units

e) (0, -10) and (0, 8)

18 units

Without graphing, how can you determine the distance between the following sets of points?

f) (32, 7) and (45, 7)

$$|32 - 45|$$

$$|-13|$$

13 units

g) (-16, -102) and (-16, 8)

$$|-102 - 8|$$

$$|-110|$$

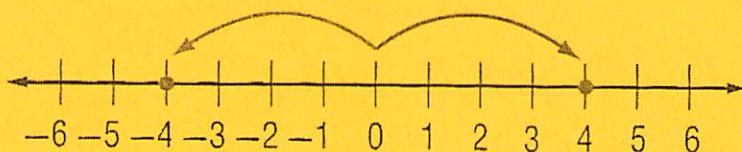**110 units**

h) (17, -14) and (17, -65)

$$|-14 - (-65)|$$

$$|51|$$

51 units

You can use what you know about number lines and opposites to compare locations on the coordinate plane. Consider the number line and coordinate plane below.

The number line shows that -4 and 4 are opposites.

The coordinate plane shows that the points (-4, 0) and (4, 0) are the same distance from the y-axis in opposite directions. So, they are *reflected* across the y-axis. Notice that the y- coordinates did not change and that the x-coordinates are opposites.
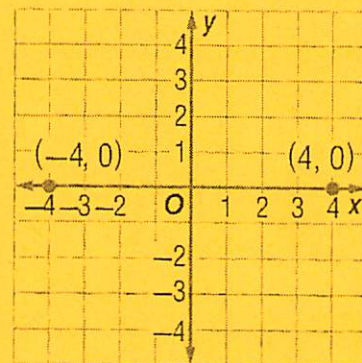
Name the ordered pair that is a reflection of each point across the x-axis.

(1, -4)   (-2, 5)   (-3, -1)

$(1,4)$ $(-2,-5)$ $(-3,1)$

Name the ordered pair that is a reflection of each point across the y-axis.

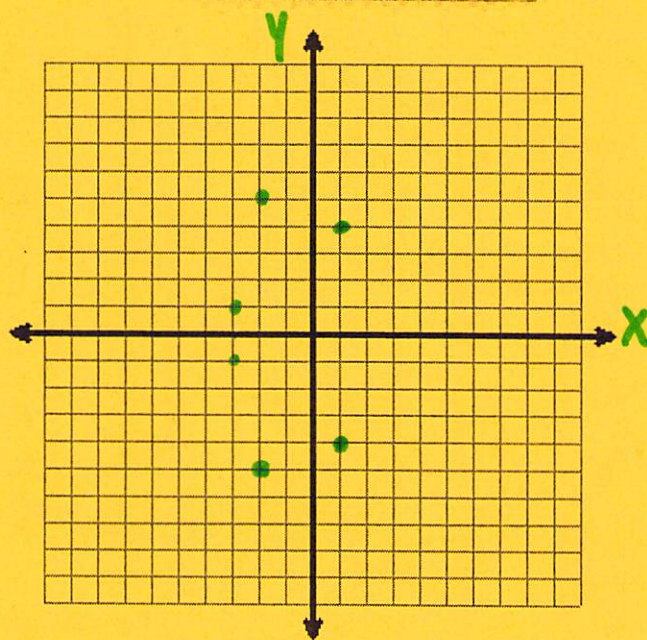(1, -4)   (-2, 5)   (-3, -1)

$(-1,-4)$ $(2,5)$ $(3,-1)$

In each column, write the coordinates of the points that are related to the given point by the criteria listed in the first column of the table.

Given Point	(5, 3)	(-2, 4)	(3, -2)	(-1, -5)
Reflected across the y-axis	$(-5,3)$	$(2,4)$	$(-3,-2)$	$(1,-5)$
Reflected across the x-axis	$(5,-3)$	$(-2,-4)$	$(3,2)$	$(-1,5)$
Reflected first across the y-axis and then the x-axis	$(-5,-3)$	$(2,-4)$	$(-3,2)$	$(1,5)$
Reflected first across the x-axis and then the y-axis	$(-5,-3)$	$(2,-4)$	$(-3,2)$	$(1,5)$