Name: _____ Period: _____ Date: _____

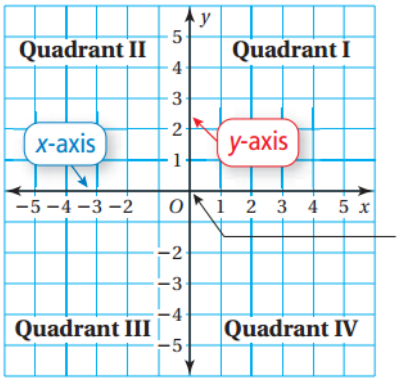
Math Unit 6: Integers and the Coordinate Plane

6.5-The Coordinate Plane

SWBAT:	**Paraphrase:**

Essential Question: How can you graph and locate points that contain negative numbers on the coordinate plane?

Vocabulary	Coordinate Plane:
Vocabulary	Origin:
Vocabulary	Quadrants:



An *ordered pair* is used to locate a point in a coordinate plane.

ordered pair: (4, −2)

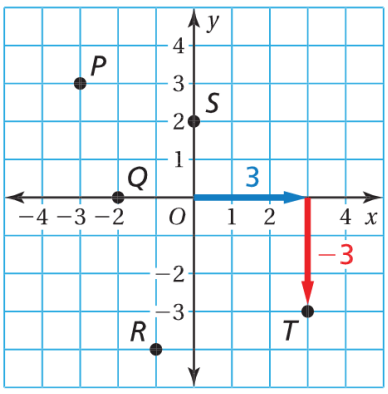
x-coordinate *y*-coordinate

Example 1

Which ordered pair corresponds to point T?

Ⓐ $(-3, -3)$ Ⓑ $(-3, 3)$

Ⓒ $(3, -3)$ Ⓓ $(3, 3)$



Point T is 3 units to the right of the origin and 3 units down. So, the x-coordinate is 3 and the y-coordinate is -3.

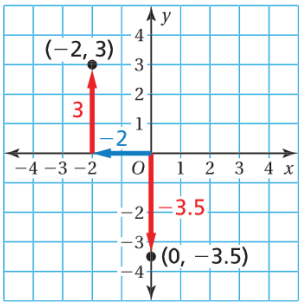
∴ The ordered pair $(3, -3)$ corresponds to point T. The correct answer is Ⓒ.

Your Turn

Use the graph in Example 1 to write an ordered pair corresponding to the point.

1. Point P **2.** Point Q **3.** Point R **4.** Point S

Example 2



Plot (a) $(-2, 3)$ and (b) $(0, -3.5)$ in a coordinate plane. Describe the location of each point.

a. Start at the origin. Move 2 units left and 3 units up. Then plot the point.

∴ The point is in Quadrant II.

b. Start at the origin. Move 3.5 units down. Then plot the point.

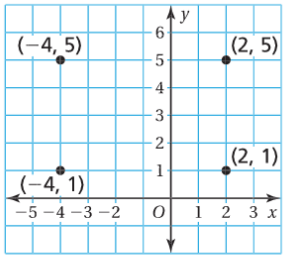
∴ The point is on the y-axis.

Your Turn

Plot the ordered pair in a coordinate plane. Describe the location of the point.

5. $(3, -1)$ **6.** $(-5, 0)$ **7.** $(-2.5, -1)$ **8.** $\left(-1\frac{1}{2}, \frac{1}{2}\right)$

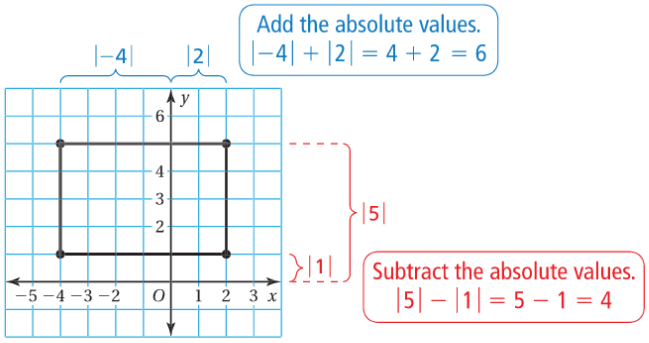
Example 3



An *archaeologist* divides an area using a coordinate plane in which each unit represents 1 meter. The corners of a secret chamber are shown in the graph. What are the dimensions of the secret chamber?

The length of the chamber is the distance between $(-4, 5)$ and $(2, 5)$. The width of the chamber is the distance between $(2, 5)$ and $(2, 1)$.

You can use absolute values to find the distances between the points.



∴ The secret chamber is 6 meters long and 4 meters wide.

Your Turn

In Example 3, the archaeologist finds a gold coin at $(-1, 4)$, a silver coin at $(-4, 2)$, and pottery at $(-4, 4)$. How much closer is the pottery to the silver coin than to the gold coin?

Example 4

A blizzard hits a town at midnight. The table shows the hourly temperatures from midnight to 8:00 A.M.

Hours after Midnight, x	0	1	2	3	4	5	6	7	8
Temperature, y	7°F	5°F	3°F	0°F	−1°F	−4°F	−5°F	−2°F	2°F

a. Display the data in a line graph.

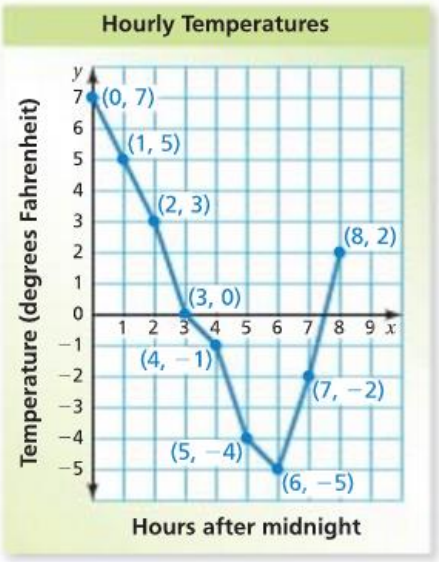
Write the ordered pairs.

(0, 7) (1, 5) (2, 3)

(3, 0) (4, –1) (5, −4)

(6, −5) (7, −2) (8, 2)

Plot and label the ordered pairs. Then connect the ordered pairs with line segments.



b. Make three observations from the graph.

Three possible observations follow:

- The hourly temperatures decrease from midnight to 6:00 A.M.
- The hourly temperatures increase from 6:00 A.M. to 8:00 A.M.
- The greatest decrease in hourly temperatures from one hour to the next is 3°F. This happens twice: from 2:00 A.M. to 3:00 A.M. and from 4:00 A.M. to 5:00 A.M.

Notes / Questions

Let's Practice

1. An interior designer maps out a room design using a coordinate plane in which each unit represents 1 yard. The corners of the room are located at (-3,2), (5,2), (5,-3), and (-3,-3). What are the dimensions of the room?

2. The table shows the hourly temperatures on a winter morning from 6 a.m. to 11 a.m.

Hours after 6 A.M., x	0	1	2	3	4	5
Temperature, y	$-2^{\circ}C$	$-5^{\circ}C$	$-1^{\circ}C$	$2^{\circ}C$	$5^{\circ}C$	$10^{\circ}C$

a. Display the data in a line graph.

b. Make three observations from the graph.