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*Understand signs of numbers as relates to location in the coordinate plane*

**Unit 13**  
Standard 6.NS.C.6b

### **Unit 13 Standards**

(Student pages 79–84)

#### **Common Core Standards for Mathematics: 6.NS.C.6**

<b>Domain</b>	The Number System
<b>Cluster</b>	Apply and extend previous understandings of numbers to the system of rational numbers.
<b>Standard</b>	6.NS.C.6 Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.  b. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.

#### **Other Standards Addressed in this Unit**

6.NS.C.6a, 6.NS.C.6c, 5.G.A.1

#### **Standards for Mathematical Practice Addressed in this Unit**

MP.1	Make sense of problems and persevere in solving them.
MP.2	Reason abstractly and quantitatively.
MP.3	Construct viable arguments and critique the reasoning of others.
MP.4	Model with mathematics.
MP.5	Use appropriate tools strategically.
MP.6	Attend to precision.
MP.7	Look for and make use of structure.
MP.8	Look for and express regularity in repeated reasoning.

#### **Unpacking the Standards**

In grade 5, students located points on a coordinate plane in Quadrant I. Students used naming conventions such as  $x$ -axis,  $x$ -coordinate,  $y$ -axis, and  $y$ -coordinate. In grade 6, students discover that just as the number line extends to the left of 0 to include negative values so does the coordinate plane, extending in four directions to create four quadrants. Students use the names of the four quadrants and identify the signs of the coordinates for each quadrant. Students also identify the point of intersection for the  $x$ -axis and the  $y$ -axis as the origin. Sixth-grade students reflect points across the  $x$ -axis and across the  $y$ -axis, determining that the only difference in the ordered pairs is the sign of one of the coordinates (the  $x$ -value when reflected across the  $y$ -axis and the  $y$ -value when reflected across the  $x$ -axis).

**Unit 13**

Standard 6.NS.C.6b

*Understand signs of numbers as relates to location in the coordinate plane*

**Getting Started**

**Introduction Activity**

The teacher reads the book *Sir Cumference and the Viking's Map* by Cindy Neuschwander. After reading the book, students direct the teacher to label important components, including the x-axis, the y-axis, and the origin, on a large coordinate plane. The large coordinate plane can be a poster, a wall-mounted dry erase board, a coordinate plane that is projected on the wall, or a coordinate plane created using painter's tape on the wall. The teacher records a number scale on each axis, and students discuss the signs of the coordinates for each quadrant, noting the values on the x- and y-axes. While the teacher is demonstrating how to label the coordinate plane, each student labels his/her own coordinate plane on an individual response board (boards are available that are blank on one side and have a coordinate plane on the other) or a handout of a coordinate plane. Students graph the points mentioned in the story, including (0, 0), (3, 0), (2, -1), (-3, -3), and other points as directed by the teacher.

*(DOK 1, Bloom's Level: Comprehension/Understand)*

**Suggested Formative Assessment**

On the back of the response board or coordinate graph paper, each student writes the steps to follow when plotting an ordered pair on a coordinate plane. Students share steps with the class. The teacher notes answers and observes student work to determine if additional instruction is necessary.

*(DOK 2, Bloom's Level: Comprehension/Understand)*

**Literature Connections**

*The Fly on the Ceiling* – Dr. Julie Glass

*Algebra & Geometry: Anything but Square!* – Dan Green

*Mathematicians Are People, Too: Stories from the Lives of Great Mathematicians, Vol. 2* – Luetta Reimer and Wilbert Reimer

*Sir Cumference and the Viking's Map* – Cindy Neuschwander

**Vocabulary Focus**

The following are essential vocabulary terms for this unit.

axis/axes	ordered pair	positive number	x-axis
coordinate plane	origin	quadrant	x-coordinate
integers	plot	rational number	y-axis
negative number	point	reflection	y-coordinate

Understand signs of numbers as relates to location in the coordinate plane

**Unit 13**  
Standard 6.NS.C.6b

**Vocabulary Activity**

**Swat the Term**

The teacher displays a large, unlabeled coordinate plane (with all four quadrants). The coordinate plane could be a poster or a wall-mounted dry erase board. It could also be projected on the wall or created using painter’s tape. Students form two teams. The first player from each team receives a flyswatter from the teacher. The teacher calls a vocabulary term and the players swat a corresponding location on the grid. The player who first swats a correct location wins one point for his/her team. The players are then replaced with the next player from each team, and the game continues. The activity can be expanded to include instructions such as the following.

- Swat the quadrant in which the  $x$ - and  $y$ -coordinates are both positive. (Quadrant I)
- Swat the quadrant in which the  $x$ - and  $y$ -coordinates are both negative. (Quadrant III)
- Swat the quadrant in which the  $x$ -coordinate is positive and the  $y$ -coordinate is negative. (Quadrant IV)
- Swat the quadrant in which the  $x$ -coordinate is negative and the  $y$ -coordinate is positive. (Quadrant II)
- Swat the quadrant that contains the ordered pair  $(-3, -4)$ . (Quadrant III)
- Swat the quadrant that contains the ordered pair  $(2, -6)$ . (Quadrant IV)
- Swat the quadrant that contains the ordered pair  $(-\frac{1}{2}, 2)$ . (Quadrant II)
- Swat the quadrant that contains the ordered pair  $(2, 3.5)$ . (Quadrant I)

*(DOK 1, Bloom’s Level: Comprehension/Understand)*

**Suggested Formative Vocabulary Assessment**

On a sheet of paper, each student draws a pair of perpendicular lines to represent the  $x$ - and  $y$ -axes, dividing the paper into four sections. Students label the  $x$ -axis,  $y$ -axis, origin, and each of the four quadrants. In each quadrant, students record three facts (using complete sentences) about that quadrant. The teacher reviews student work to assess student learning and then plans additional instruction as needed.

*(DOK 2, Bloom’s Level: Comprehension/Understand)*

**Suggested Instructional Activities**

1. The teacher distributes two colors of index cards to the class, one card per student. On one color of card, the value of an  $x$ -coordinate is printed, and on the other color of card, the value of a  $y$ -coordinate is printed.

<p><math>x</math>-coordinate</p> <p><math>-7</math></p>
---

<p><math>y</math>-coordinate</p> <p>2</p>
---

**Unit 13**

Standard 6.NS.C.6b

*Understand signs of numbers as relates to location in the coordinate plane*

On the teacher’s signal, students move to find a student holding a different colored card than their own. Pairs discuss the coordinates on the cards and determine the location of the point described by the ordered pair on the coordinate plane. Students take turns sharing the coordinates and their locations and explaining how they know the location is correct. Students again move to find different classmates, and the process is repeated. The teacher monitors student interactions and offers assistance as needed.

*(DOK 2, Bloom’s Level: Comprehension/Understand)*

- The teacher displays a coordinate grid with point  $A(-2, 5)$  plotted. The teacher distributes the following chart to each student.

	<b>Similarities in the Coordinates for the Points</b>	<b>Differences in the Coordinates for the Points</b>	<b>Similarities in the Locations of the Points</b>	<b>Differences in the Locations of the Points</b>
$A(-2, 5)$ and $B(-2, -5)$				
$A(-2, 5)$ and $C(2, 5)$				
$A(-2, 5)$ and $D(2, -5)$				

Working with partners, students plot each set of points on coordinate grids and complete their charts. Next, the teacher calls on pairs to plot the points on the class coordinate grid and explain the information from their charts. The teacher and class discuss the reflection of points across the  $x$ - and  $y$ -axes and the changes in the ordered pairs. The teacher provides additional points and instructions for reflecting each point across either the  $x$ - or  $y$ -axis or both. Students perform the reflections on individual coordinate planes and record the ordered pairs for each point. The teacher monitors and provides assistance as needed.

*(DOK 2, Bloom’s Level: Comprehension/Understand)*

- The teacher distributes index cards printed with two ordered pairs to each student. On opposite sides of the classroom, the teacher posts two signs, “Reflection across  $x$ -axis” and “Reflection across  $y$ -axis.” Students study the ordered pairs on their cards. On the teacher’s signal, students move to the side of the room with the sign that describes their ordered pairs. When all students have moved, groups discuss the cards and determine if any person needs to change locations. The teacher checks to see that students are in the correct location and makes clarifications as needed. The cards are then collected and redistributed to repeat the activity as needed.

*(DOK 2, Bloom’s Level: Comprehension/Understand)*

*Understand signs of numbers as relates to location in the coordinate plane*

**Unit 13**  
Standard 6.NS.C.6b

**Suggested Formative Assessment**

Each student receives a coordinate plane printed on a quarter-sheet of paper. The plane has no labels. Students record the signs of the coordinates in each quadrant as well as the name of the quadrant in the appropriate locations on the plane. The teacher displays an ordered pair and students plot the point on the coordinate plane. Students reflect the point across the  $x$ -axis and label it and then reflect the original point across the  $y$ -axis and label it. The teacher reviews student responses and plans additional instruction or intervention as needed.

*(DOK 2, Bloom's Level: Comprehension/Understand)*

**Suggested Reflection/Closure Activity**

Students complete the Motivation Station activity "Where's the Point?" on page 84 of the student edition.

*(DOK 1, Bloom's Level: Analysis/Analyze)*

**Suggested Formative Assessment**

The teacher provides each student with an exit ticket such as the one shown. Students complete the tickets and return them to the teacher as they leave. The teacher reviews the answers and determines the need for additional instruction or intervention.

Label the  $x$ -axis and the  $y$ -axis.

Draw point  $O$  at the origin.

Label each quadrant with I, II, III, or IV.

For each quadrant, identify the signs of the  $x$ - and  $y$ -coordinates. Then, label the coordinates for each point.

Name two points that are reflections across the  $x$ -axis. Explain the relationship between the coordinates of the ordered pairs.

Name two points that are reflections across the  $y$ -axis. Explain the relationship between the coordinates of the ordered pairs.

*(DOK 2, Bloom's Level: Comprehension/Understand)*

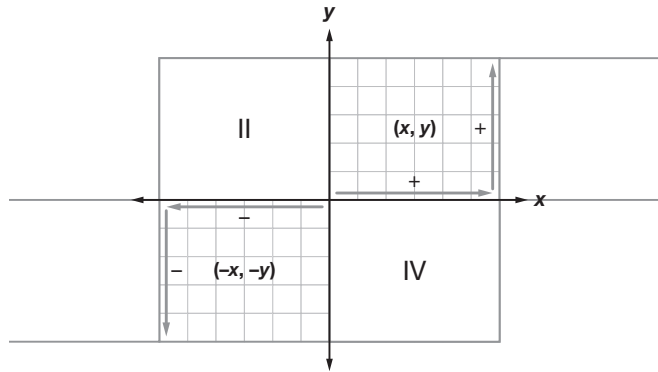
**Unit 13**

Standard 6.NS.C.6b

*Understand signs of numbers as relates to location in the coordinate plane*

**Interventions**

- Each student creates a graphic organizer that can be used when solving problems from the unit. The teacher provides a blank grid to each student. Each student draws and labels an  $x$ - and  $y$ -axis on their grids. In each quadrant, students use arrows to indicate the movement across the  $x$ -axis first (positive or negative) and the  $y$ -axis second (positive or negative). Students then write the signs of the ordered pairs in each quadrant. Students create flaps that cover each quadrant by taping pieces of construction paper to the right and left sides of the coordinate plane. On the outer part of the flap, students label each quadrant.



*(DOK 2, Bloom's Level: Comprehension/Understand)*

- The teacher provides a coordinate plane and charts, similar to the ones shown, to each student. Students plot three points (in different quadrants) and their reflections over the  $x$ -axis on the coordinate plane. Each student completes the chart by recording the ordered pairs for each point plotted. With partners, students discuss what they notice about the ordered pairs of the points compared to the ordered pairs of the reflections. Each student writes a conclusion below the chart about points that are reflected across the  $x$ -axis. The process is repeated for reflections across the  $y$ -axis.

**Reflections across the  $x$ -axis**

Point	Reflection

**Reflections across the  $y$ -axis**

Point	Reflection

*(DOK 2, Bloom's Level: Comprehension/Understand)*

- Students play a game in groups of four. Each group uses two dice (red and white) and a spinner with sections labeled I, II, III, and IV. Each player in the group receives a blank coordinate plane. In turn, each player rolls the dice to determine an ordered pair. (The red die indicates the  $x$ -coordinate, and the white die indicates the  $y$ -coordinate.) Then the player spins the spinner to determine the quadrant and the signs for the ordered pair. The player locates, marks, and labels the correct point on the coordinate grid. Other players must confirm correct placement before play passes to the next player. The winner is the first player to correctly plot an ordered pair in all four quadrants of his/her coordinate plane.

*(DOK 1, Bloom's Level: Comprehension/Understand)*



*Understand signs of numbers as relates to location in the coordinate plane*

**Unit 13**  
Standard 6.NS.C.6b

### Suggested Formative Assessment

The teacher interviews each student in the intervention group. The teacher gives each student a coordinate plane and displays several ordered pairs. The student tells in which quadrant each ordered pair is located and how he/she knows. Then the teacher displays pairs of coordinates that show reflections over the  $x$ -axis, the  $y$ -axis, or both axes. Students identify which pairs show reflections and justify their responses. Based on student responses, the teacher modifies instruction and/or plans additional interventions.

*(DOK 2, Bloom's Level: Comprehension/Understand)*

### Extending Student Thinking

Students use grade-appropriate Internet and library resources to research the life and accomplishments of René Descartes, the mathematician credited with the development of the Cartesian plane. Students create a presentation for the class by organizing information and graphics on a trifold board or by creating a dramatic monologue in which a student poses as Descartes and describes his life and accomplishments.

*(DOK 4, Bloom's Level: Synthesis/Create)*

### Skillful Thinking

*Skillful Thinking = Deeper Learning through Revised Bloom's Taxonomy, Depth of Knowledge, and 9 Traits of Critical Thinking*

The 9 *Traits of Critical Thinking*<sup>™</sup> include *adapt, collaborate, communicate, create, examine, inquire, link, reflect, and strive*. These traits foster high-quality thinkers. On the Skillful Thinking page in each unit of the student edition, traits are selected and identified in each questioning prompt to reinforce student use of the traits in the context of mathematics. The labeling of the traits assists students in recognizing that the application of a focus trait is needed to complete the questioning prompt. The educator should note that each questioning prompt in the student edition is not limited to the identified trait since multiple critical thinking traits may be utilized by the student to successfully respond to the prompt.



**Collaborate** – I work with others to achieve better outcomes.

- ✓ Engagement Indicator – Students think in concert with others to promote productivity.
- ✓ Strategy to Facilitate the **Collaborate** Trait – Guide students to contribute to group work, justify thinking, and test solutions or ideas.



**Adapt** – I use my knowledge and imagination to express new and innovative ideas.

- ✓ Engagement Indicator – Students approach a problem in more than one way.
- ✓ Strategy to Facilitate the **Adapt** Trait – Have students generate a variety of problem-solving strategies for a given situation.

**Unit 13**

Standard 6.NS.C.6b

*Understand signs of numbers as relates to location in the coordinate plane*

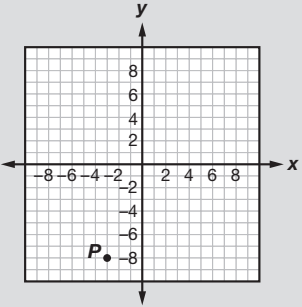
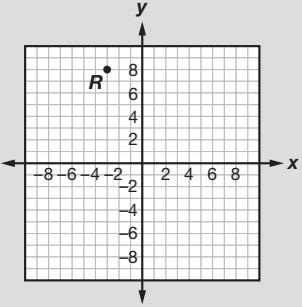
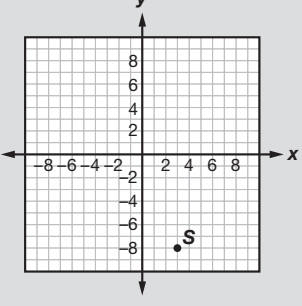
**Answer Key and Codings**

Page	Question	Answer	DOK Level	Bloom's Original/Revised
79	1	point <i>D</i>	1	Comprehension/Understand
	2	None; Point <i>C</i> is located on the <i>x</i> -axis.	2	Comprehension/Understand
	3	negative	1	Comprehension/Understand
	4	Begin at the origin, move right for positive <i>x</i> units, and then move down for negative <i>y</i> units. Quadrant IV	2	Comprehension/Understand
	5	(-0.5, -1.5) The <i>x</i> -coordinates are opposites, and the <i>y</i> -coordinates are the same.	2	Comprehension/Understand
	6	<p>Point <i>A</i> represents the reflection of point <i>D</i> across the <i>x</i>-axis.</p>	2	Comprehension/Understand
	7	Quadrants II or III because the <i>x</i> -values are negative to the left of zero	2	Comprehension/Understand
	8	(+, +) (-, -)	2	Comprehension/Understand
80	1	<i>A</i> , <i>C</i> , <i>D</i> , and <i>F</i>	2	Comprehension/Understand
	2	<i>C</i>	2	Comprehension/Understand
	3	<i>A</i> –True <i>B</i> –False <i>C</i> –True <i>D</i> –True	2	Comprehension/Understand
	4	<i>B</i>	2	Comprehension/Understand
	5	<i>C</i>	2	Comprehension/Understand
81	1	<i>B</i> , <i>C</i> , and <i>F</i>	1	Comprehension/Understand
	2	<i>B</i>	2	Comprehension/Understand
	3	<i>C</i>	1	Comprehension/Understand
	4	<i>A</i> –False <i>B</i> –True <i>C</i> –True <i>D</i> –False	1	Comprehension/Understand

Understand signs of numbers as relates to location in the coordinate plane

**Unit 13**  
Standard 6.NS.C.6b

**Answer Key and Codings**

Page	Question	Answer	DOK Level	Bloom's Original/Revised
82	1	B	1	Comprehension/Understand
	2	B	2	Comprehension/Understand
	3	A-True B-False C-True D-True	2	Comprehension/Understand
	4		1	Comprehension/Understand
	5	Quadrant III	1	Comprehension/Understand
	6	 Quadrant II	1	Comprehension/Understand
	7	 Quadrant IV	1	Comprehension/Understand

**Unit 13**

Standard 6.NS.C.6b

*Understand signs of numbers as relates to location in the coordinate plane*

**Answer Key and Codings**

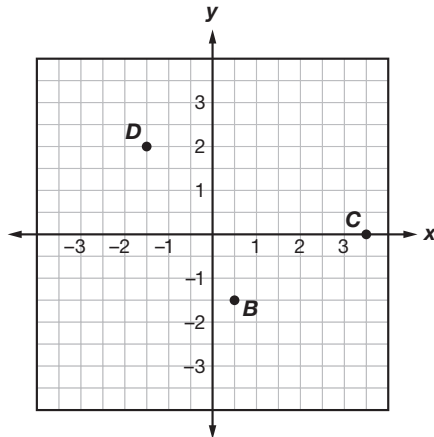
Page	Question	Answer	DOK Level	Bloom's Original/Revised
83	1	$(6, -\frac{2}{3})$ Justifications will vary.	2	Analysis/Analyze
	2	Quadrant IV; Explanations will vary. Quadrant III; Explanations will vary. Quadrant III; Explanations will vary.	2	Analysis/Analyze
	Journal	The $x$ -coordinate is less than the $y$ -coordinate because the $x$ -coordinate is always negative and the $y$ -coordinate is always positive in Quadrant II.	2	Comprehension/Understand
84	Motivation Station	1. Quadrant IV 2. Quadrant III 3. Quadrant I 4. Quadrant II Plotted points will vary.	2	Analysis/Analyze

Name \_\_\_\_\_

Standard 6.NS.C.6b

Unit 13 Introduction 

Use the graph to answer questions 1–8.



- Which point is located in Quadrant II?
- In what quadrant is point  $C$  located? Explain.
- What is the sign of the  $y$ -coordinate for point  $B$ ?
- Explain how to graph point  $E$ , where  $x > 0$  and  $y < 0$ .

In what quadrant is point  $E$  located?

- Point  $B$  is reflected across the  $y$ -axis. What are the coordinates of the reflection?

How are the coordinates of point  $B$  and the coordinates of the reflection similar and how are they different?

- Plot point  $A(-1.5, -2)$ .

Write a statement that describes the relationship between point  $D$  and point  $A$ .

- Point  $F$  has an  $x$ -coordinate that is negative. In which quadrant(s) could point  $F$  be located? Explain your answer.

- Point  $G$  is located on the coordinate plane where  $x < 0$  and  $y > 0$ . If point  $G$  is reflected across the  $y$ -axis, what are the signs of the coordinates of the reflection?

If point  $G$  is reflected across the  $x$ -axis, what are the signs of the coordinates of the reflection?

**Words for the Wise**

axis/axes

coordinate plane

integers

negative number

ordered pair

origin

plot

point

positive number

quadrant

rational number

reflection

$x$ -axis

$x$ -coordinate

$y$ -axis

$y$ -coordinate

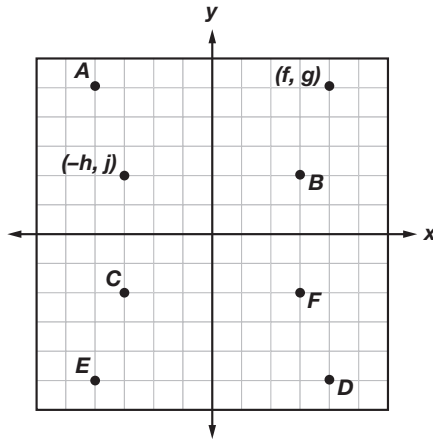


Name \_\_\_\_\_

**Unit 13** Partner Practice

Standard 6.NS.C.6b

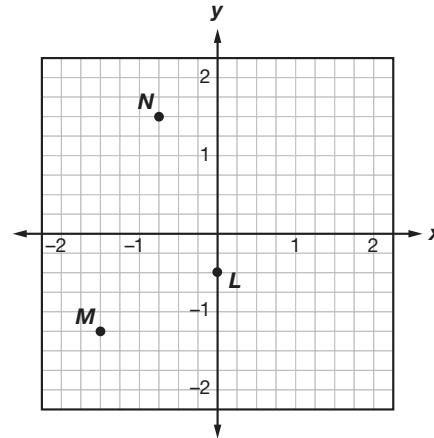
1. Two points are plotted at  $(f, g)$  and  $(-h, j)$  on the graph.



Which of the following shows the correct ordered pairs for the labeled points on the graph? Select **all** that apply.

- A  $A(-f, g)$
  - B  $B(h, -j)$
  - C  $C(-h, -j)$
  - D  $D(f, -g)$
  - E  $E(f, -g)$
  - F  $F(h, -j)$
2. A point in Quadrant II is reflected across first the  $x$ -axis and then the  $y$ -axis. Which **best** describes the coordinates of the reflected point?
- A  $(+, +)$
  - B  $(-, +)$
  - C  $(+, -)$
  - D  $(-, -)$

- Use the graph to answer questions 3–5.



3. Check True or False for each statement.

	True	False
A	<input type="checkbox"/>	<input type="checkbox"/>
B	<input type="checkbox"/>	<input type="checkbox"/>
C	<input type="checkbox"/>	<input type="checkbox"/>
D	<input type="checkbox"/>	<input type="checkbox"/>

4. What are the coordinates for the reflection of point  $M$  across the  $x$ -axis?

- A  $(-1\frac{1}{2}, -1\frac{1}{4})$
- B  $(-1\frac{1}{2}, 1\frac{1}{4})$
- C  $(1\frac{1}{2}, -1\frac{1}{4})$
- D  $(1\frac{1}{2}, 1\frac{1}{4})$

5. What are the coordinates for the reflection of point  $N$  across the  $y$ -axis?

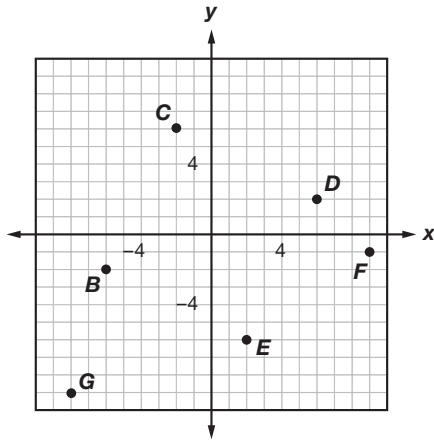
- A  $(-\frac{3}{4}, 1\frac{1}{2})$
- B  $(-\frac{3}{4}, -1\frac{1}{2})$
- C  $(\frac{3}{4}, 1\frac{1}{2})$
- D  $(\frac{3}{4}, -1\frac{1}{2})$

Name \_\_\_\_\_

Standard 6.NS.C.6b

Unit 13 Independent Practice

Use the coordinate grid to answer questions 1 and 2.



1. Which shows the correct signs of the coordinates for each point? Select **all** that apply.

- A  $B(+, -)$
- B  $C(-, +)$
- C  $D(+, +)$
- D  $E(-, -)$
- E  $F(-, +)$
- F  $G(-, -)$

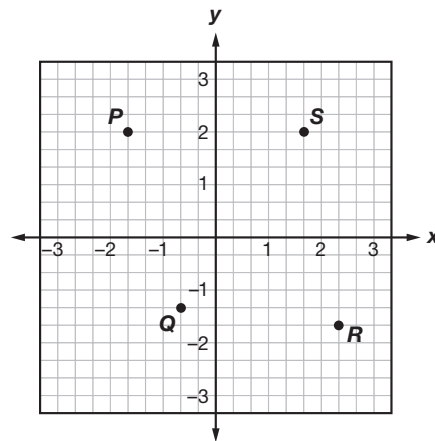
2. Point  $A$  is located at  $(-6, 2)$ . Which point on the grid shows a reflection of point  $A$  across the  $y$ -axis?

- A point  $E$
- B point  $D$
- C point  $C$
- D point  $B$

3. In which quadrant would a point be located if the  $x$ - and  $y$ -coordinates are both negative?

- A Quadrant I
- B Quadrant II
- C Quadrant III
- D Quadrant IV

4. Points  $P$ ,  $Q$ ,  $R$ , and  $S$  are graphed on the coordinate plane.



Check True or False for each statement.

	True	False
A The $x$ -coordinate for the reflection of point $R$ across the $x$ -axis is negative.	<input type="checkbox"/>	<input type="checkbox"/>
B A reflection of point $Q$ across the $x$ -axis is located in Quadrant II.	<input type="checkbox"/>	<input type="checkbox"/>
C Point $P$ is a reflection of point $S$ across the $y$ -axis.	<input type="checkbox"/>	<input type="checkbox"/>
D The $y$ -coordinate of point $P$ is $-1\frac{2}{3}$ .	<input type="checkbox"/>	<input type="checkbox"/>



Name \_\_\_\_\_

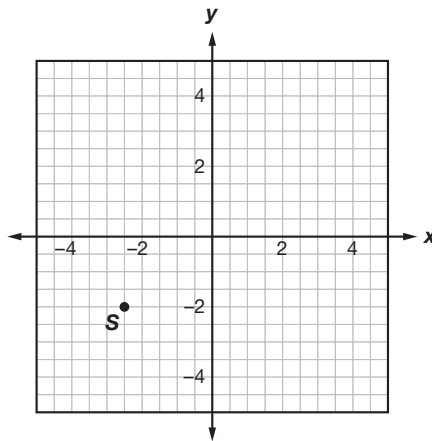
**Unit 13** Assessment

Standard 6.NS.C.6b

1. Which **best** describes the signs of all ordered pairs located in Quadrant II?

- A  $(-, -)$                       C  $(+, -)$   
 B  $(-, +)$                       D  $(+, +)$

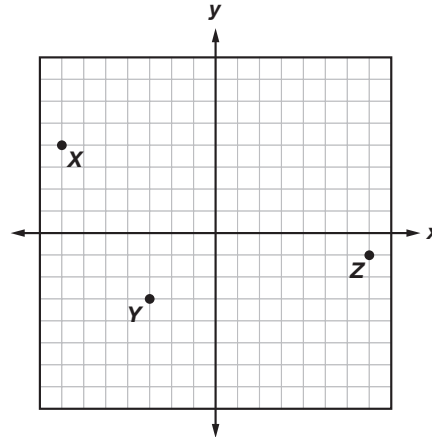
2. Look at the graph.



Which ordered pair represents the location of point *S* after a reflection across the *x*-axis and then across the *y*-axis?

- A  $(-2.5, 2)$                       C  $(-2.5, -2)$   
 B  $(2.5, 2)$                       D  $(2.5, -2)$

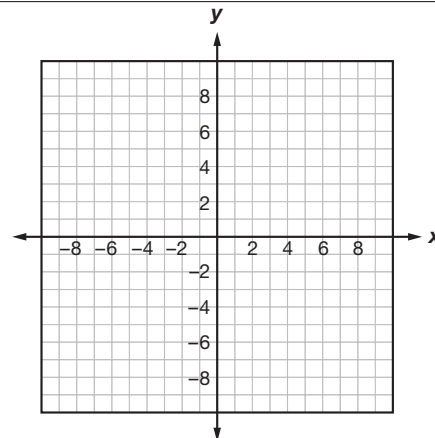
3. Points *X*, *Y*, and *Z* are plotted on a coordinate plane as shown.



Check True or False for each statement.

	True	False
A The <i>x</i> -coordinates for points <i>X</i> and <i>Y</i> are less than zero.	<input type="checkbox"/>	<input type="checkbox"/>
B The <i>y</i> -coordinate for the reflection of point <i>Z</i> across the <i>y</i> -axis is positive.	<input type="checkbox"/>	<input type="checkbox"/>
C A reflection of point <i>X</i> across the <i>y</i> -axis and then the <i>x</i> -axis is located in Quadrant IV.	<input type="checkbox"/>	<input type="checkbox"/>
D A reflection of point <i>Y</i> across the <i>x</i> -axis results in a <i>y</i> -coordinate value greater than zero.	<input type="checkbox"/>	<input type="checkbox"/>

- Plot point *P* at  $(-3, -8)$ .
- Name the quadrant in which point *P* is located.
- Plot and label point *R* so it is a reflection of point *P* across the *x*-axis. Name the quadrant in which point *R* is located.
- Plot and label point *S* so it is a reflection of point *P* across the *y*-axis. Name the quadrant in which point *S* is located.





Name \_\_\_\_\_

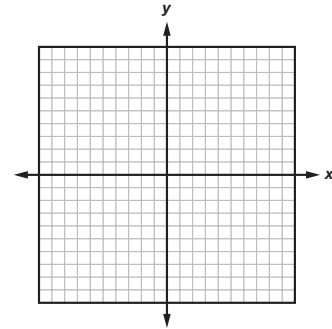
Standard 6.NS.C.6b

Unit 13 Skillful Thinking



1. Work with a partner to identify the ordered pair that meets the following criteria. Use the graph to justify your answer.

- a. The point is located in either Quadrant II or Quadrant IV.
- b. The  $x$ -coordinate is a reflection across the  $y$ -axis of the point  $(-6, 1.5)$ .
- c. The  $y$ -coordinate can be written as  $\frac{a}{3}$ , where  $a$  is an integer between  $-3$  and  $-1$ .



\_\_\_\_\_



2. The reflection of a point over the  $x$ -axis, then the  $y$ -axis, and then the  $x$ -axis results in coordinates in which  $x > 0$  and  $y < 0$ . In which quadrant is the reflected point located? Explain your answer.

\_\_\_\_\_

In which quadrant is the original point located? Explain your answer.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

If the original point is reflected a fourth time from its current location across the  $y$ -axis, in which quadrant is it located? Explain your answer.

\_\_\_\_\_  
\_\_\_\_\_

**Journal**

A point is located in Quadrant II on the coordinate plane. Is the value of the  $x$ -coordinate greater than or less than the value of the  $y$ -coordinate? Explain your answer.

\_\_\_\_\_  
\_\_\_\_\_



Name \_\_\_\_\_

**Unit 13** Motivation Station

Standard 6.NS.C.6b

**Where's the Point?**

Complete "Where's the Point?" individually. For each box, read the clues provided. Then, identify the quadrant in which a point is located based on the description. Finally, plot and label a point on the coordinate plane for each description.

1

1. My  $x$ -coordinate is positive.  
2. If I am reflected across the  $x$ -axis, my  $y$ -coordinate will be positive.  
Where am I?

3

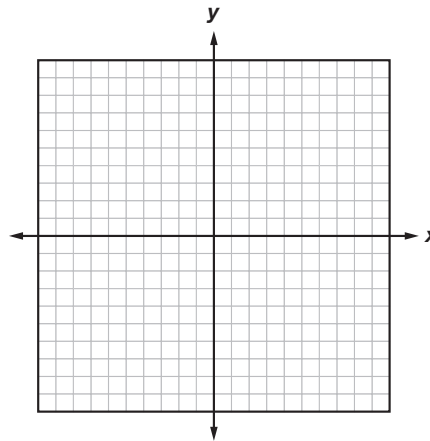
1. My  $y$ -coordinate is positive.  
2. If I am reflected across the  $y$ -axis, my  $x$ -coordinate will be negative.  
Where am I?

2

1. My  $y$ -coordinate is negative.  
2. I am a reflection across the  $y$ -axis of a point in which the  $x$ -coordinate is positive.  
Where am I?

4

1. My  $x$ -coordinate is negative.  
2. I am a reflection across the  $x$ -axis of a point in which the  $y$ -coordinate is negative.  
Where am I?



**Connections**

Use string and stakes to create a coordinate plane on the lawn. Take turns with friends and family tossing a beanbag, or similar object, onto the grid. Give the signs of the coordinates of the location where the object lands. Then give the ordered pair that represents the location. If correct, the person earns one point. The winner is the person with the most points.