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Use a number line to order the numbers from least to greatest.

1. 0.2, 0.54, 0.61, 0.4

‹+——+——+——+——+——+——+——+——+——+——+——+——+——+›
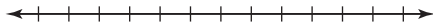
2. 0.3, 0.45, 0.11, 0.02

‹+——+——+——+——+——+——+——+——+——+——+——+——+——+›
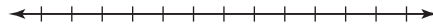
3. 1.7, 1.24, 1.02, 1.33

‹+——+——+——+——+——+——+——+——+——+——+——+——+——+›

4. 1.01, 1.42, 1.06, 1.2

‹+——+——+——+——+——+——+——+——+——+——+——+——+——+›
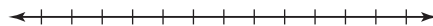
5. 0.98, 1.23, 0.87, 0.9

‹+——+——+——+——+——+——+——+——+——+——+——+——+——+›

6. 1.4, 0.06, 1.23, 0.5

‹+——+——+——+——+——+——+——+——+——+——+——+——+——+›
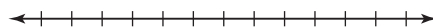
7. 0.003, 0.03, 0.033, 0.031

‹+——+——+——+——+——+——+——+——+——+——+——+——+——+›
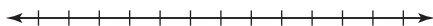
8. 0.02, 0.002, 0.2, 0.022

‹+——+——+——+——+——+——+——+——+——+——+——+——+——+›
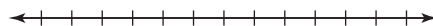
9. In your class, 0.58 of the students bring a piece of whole fruit for a snack and 0.36 of the students bring a snack pack of crackers. Which group of students brings in more food items for a snack?

Name _____ Date _____

Complete the number sentence with <, >, or =.

10. 5 ___ 8

11. 13 ___ 9

12. 0.3 ___ $\dfrac{3}{8}$

13. 0.68 ___ $\dfrac{17}{25}$

14. 3.6 ___ $\dfrac{12}{5}$

15. 0.06 ___ 0.062

Find three numbers that make the number sentence true.

16. $0.35 <$ ___

17. $\dfrac{4}{9} \geq$ ___

18. $2\dfrac{3}{5} \leq$ ___

19. $\dfrac{1}{10} <$ ___

20. $0.485 \geq$ ___

21. $5.87 \leq$ ___

22. During a trivia game, you answered 18 out of 25 questions correctly. Your friend answered 0.7 of the questions correctly. Write a number sentence for who had the greater number of correct answers.

Name_____ Date _____

6.1 Integers
For use with Activity 6.1

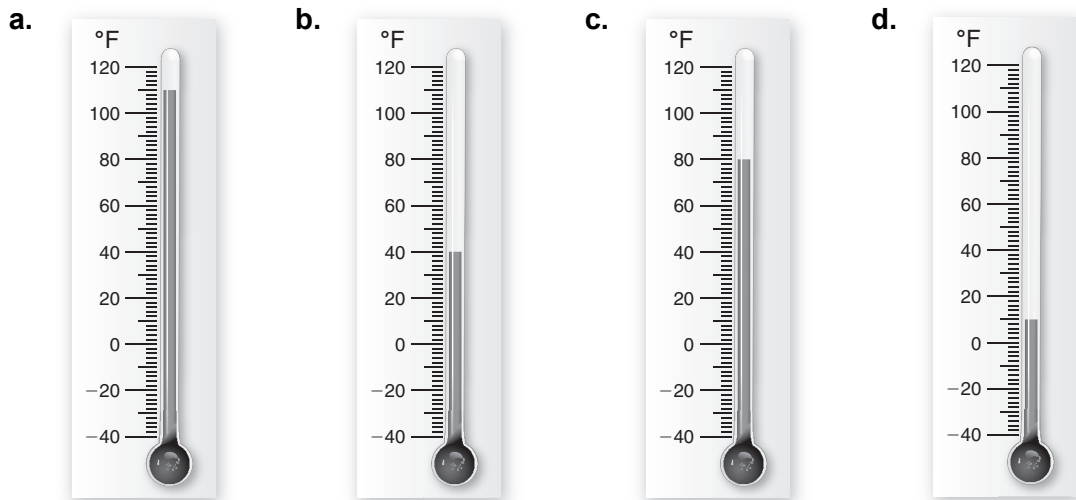**Essential Question**   How can you represent numbers that are less than 0?

1   ACTIVITY: Reading Thermometers

Work with a partner. The thermometers show the temperatures in four cities.

Honolulu, Hawaii   *Anchorage, Alaska*
Death Valley, California   *Seattle, Washington*

Write each temperature. Then match each temperature with its most appropriate location.

a.   b.   c.   d.

°F	°F	°F	°F
120	120	120	120
100	100	100	100
80	80	80	80
60	60	60	60
40	40	40	40
20	20	20	20
0	0	0	0
−20	−20	−20	−20
−40	−40	−40	−40

   e. How would you describe all the temperatures in relation to 0°F?

**2   ACTIVITY:** Describing a Temperature

Work with a partner. The thermometer on the next page shows the coldest temperature ever recorded in Seattle, Washington.

   a. What is the temperature?

6.1 **Integers** (continued)

b. How do you write temperatures that are colder than this?

c. Suppose the record for the coldest temperature in Seattle is broken by 10 degrees. What is the new coldest temperature? Draw a thermometer that shows the new coldest temperature.
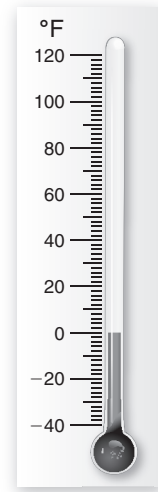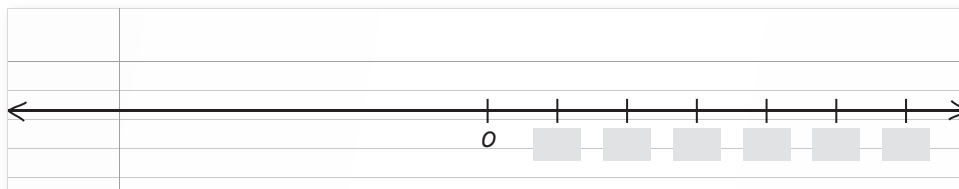
d. How is the new coldest temperature different from the temperatures in Activity 1?

3 **ACTIVITY:** Extending the System of Whole Numbers

Work with a partner.

a. Draw a number like the one shown on a sheet of paper. Complete the number line using whole numbers only.

b. Fold the paper with your number line around 0 so that the lines overlap. Make tick marks on the other side of the number line to match the tick marks for the whole numbers.

c. **STRUCTURE** Compare this number line to the thermometers from Activities 1 and 2. What do you think the new tick marks represent? How would you label them?

Name_____ Date _____

What Is Your Answer?

4. **IN YOUR OWN WORDS** How can you represent numbers that are less than 0?

5. Describe another real-life example that uses numbers that are less than 0?

6. **REASONING** How are the temperatures shown by the thermometers at the right similar? How are they different?
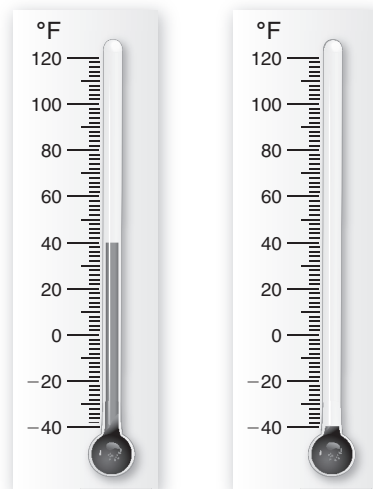

7. **WRITING** The temperature in a town on Thursday evening is 25°F. On Sunday morning, the temperature drops below 0°F. Write a story to describe what may have happened in the town. Be sure to include the temperatures for each day.

Name _____ Date _____

6.1 Practice
For use after Lesson 6.1

Write a positive or negative integer that represents the situation.

1. You gain 60 points in a board game.

2. The temperature is 9 degrees below zero.

3. The stock market drops 18 points.

4. You earn $125 at your job.

Graph the integer and its opposite.

5. -9

6. 5

7. 14

8. -20

9. -56

10. 850
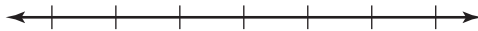
11. You hike 72 feet up a mountain. The next day, you hike 12 feet down the mountain. Write an integer to represent each situation.

6.2 Comparing and Ordering Integers
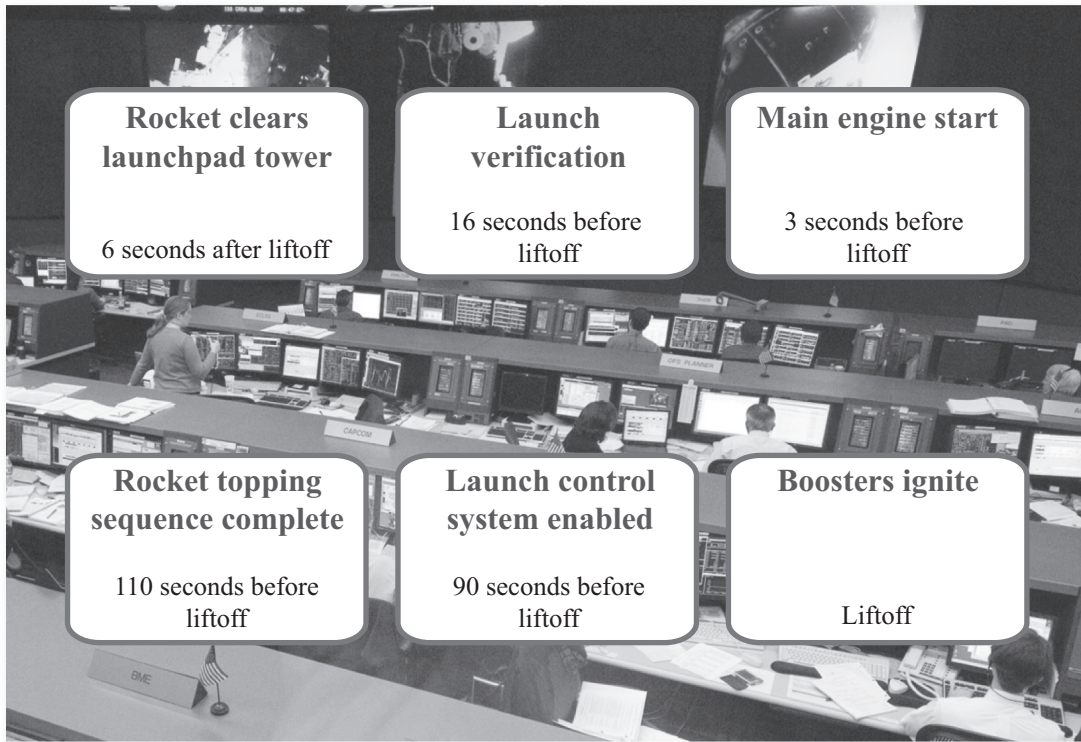**For use with Activity 6.2**

Essential Question   How can you use a number line to order real-life events?

1   ACTIVITY: Seconds to Takeoff

Work with a partner. You are listening to a command center before the liftoff of a rocket.

You hear the following:

"**T minus 10 seconds…go for main engine start…T minus 9…8… 7…6…5…4…3…2…1…we have liftoff.**"

Rocket clears launchpad tower	Launch verification	Main engine start
6 seconds after liftoff	16 seconds before liftoff	3 seconds before liftoff
Rocket topping sequence complete	Launch control system enabled	Boosters ignite
110 seconds before liftoff	90 seconds before liftoff	Liftoff

a. Draw a number line. Then locate the events shown above at appropriate points on the number line.

b. Which event occurs at zero on your number line? Explain.

6.2 **Comparing and Ordering Integers** (continued)

    c. Which of the events occurs first? Which of the events occurs last? How do you know?

    d. List the events in the order they occurred.

2 **ACTIVITY:** Being Careful with Terminology

Work with a partner.

    a. Use a number line to show that the phrase "3 seconds away from liftoff" can have two meanings.

    b. Reword the phrase "3 seconds away from liftoff" in two ways so that each meaning is absolutely clear.

    c. Explain why you must be very careful with terminology if you are working in the command center for a rocket launch.

6.2 **Comparing and Ordering Integers** (continued)

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3 **ACTIVITY:** A Day in the Life of an Astronaut

Make a time line that shows a day in the life of an astronaut. Use the Internet or another reference source to gather information.

- Use a number line with units representing hours. Start at 12 hours before liftoff and end at 12 hours after liftoff. Locate the liftoff at 0. Assume liftoff occurs at noon.

- Include at least five events before liftoff, such as when the astronauts suit up.

- Include at least five events after liftoff, such as when the rocket enters Earth's orbit.

- How do you determine where each event occurs on the number line?

What Is Your Answer?

4. **IN YOUR OWN WORDS** How can you use a number line to order real-life events?

5. Describe how you can use a number line to create a time line.

Name _____ Date _____

6.2 Practice
For use after Lesson 6.2

Complete the statement using < or >.

1. 0 _____ 9

2. 8 _____ -3

3. -5 _____ -7

4. -12 _____ 0

5. -6 _____ -2

6. -21 _____ -40

Order the integers from least to greatest.

7. $1, -3, -6, 5, 0$

8. $2, -4, -9, 3, -1$

9. $11, -11, 18, -18, -8$

10. $21, -14, -35, 28, -7$

11. Your miniature golf scores for the first half of a course are $-3, 7, -2, -5, 3,$ $-1, 0, 4, -4.$ Order the scores from least to greatest.

6.3 Fractions and Decimals on the Number Line
For use with Activity 6.3

Essential Question   How can you use a number line to compare positive and negative fractions and decimals?

---

1   **ACTIVITY:** Locating Fractions on a Number Line

On your time line for "A Day in the Life of an Astronaut" from Activity 3 in Section 6.2, include the following events. Represent each using a fraction or a mixed number.

   a. Radio Transmission: 10:30 A.M.

   b. Space Walk: 7:30 P.M.

   c. Physical Exam: 4:45 A.M.

   d. Photograph Taken: 3:15 A.M.

   e. Float in the Cabin: 6:20 P.M.
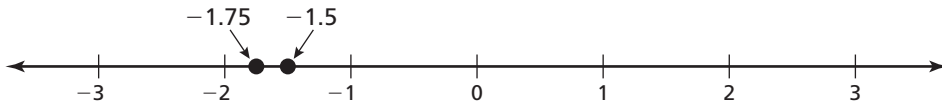
   f. Eat Dinner: 8:40 P.M.

---

2   **ACTIVITY:** Fractions and Decimals on a Number Line

Work with a partner. Find a number that is between the two numbers. The number must be greater than the number on the left *and* less than the number on the right.
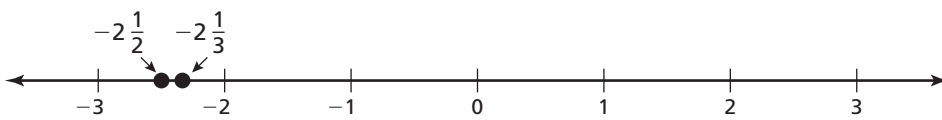
   a.
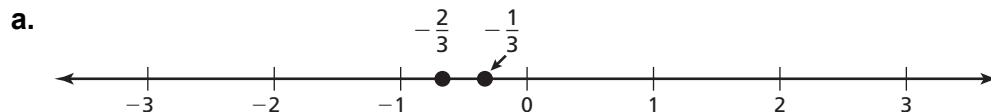
6.3 **Fractions and Decimals on the Number Line (continued)**

b.

c.

3 **ACTIVITY: Decimals on a Number Line**

Work with a partner.

Snorkeling: Scuba diving: Deep sea diving:
-5 meters -50 meters -700 meters

a. Write the position of each diver in kilometers.

b. **CHOOSE TOOLS** Would a horizontal or a vertical number line be more appropriate for representing these data? Why?

6.3 **Fractions and Decimals on the Number Line** (continued)

c. Use a number line to order the positions from deepest to shallowest.

What Is Your Answer?

4. **IN YOUR OWN WORDS** How can you use a number line to compare positive and negative fractions and decimals?

5. Draw a number line. Graph and label three values between -2 and -1.

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6.3 Practice
For use after Lesson 6.3

Complete the statement using < or >.

1. 3.7 ____ −3.2

2. −10.4 ____ −10.04

3. $-\dfrac{2}{3}$ ____ $\dfrac{1}{4}$

4. $-2\dfrac{2}{3}$ ____ $-2\dfrac{1}{2}$
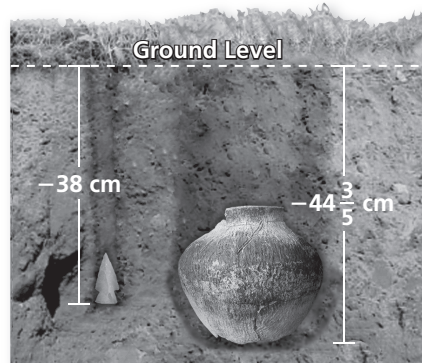
Order the numbers from least to greatest.

5. −2, 0, −4, 2, 3

6. −6.3, 4.2, 7.7, −3.9, 3.4

7. $1\dfrac{4}{5}, \dfrac{1}{2}, -3\dfrac{7}{8}, -\dfrac{7}{9}, -\dfrac{3}{5}$

8. $-3, 0.6, \dfrac{1}{4}, 0, -1\dfrac{2}{3}$

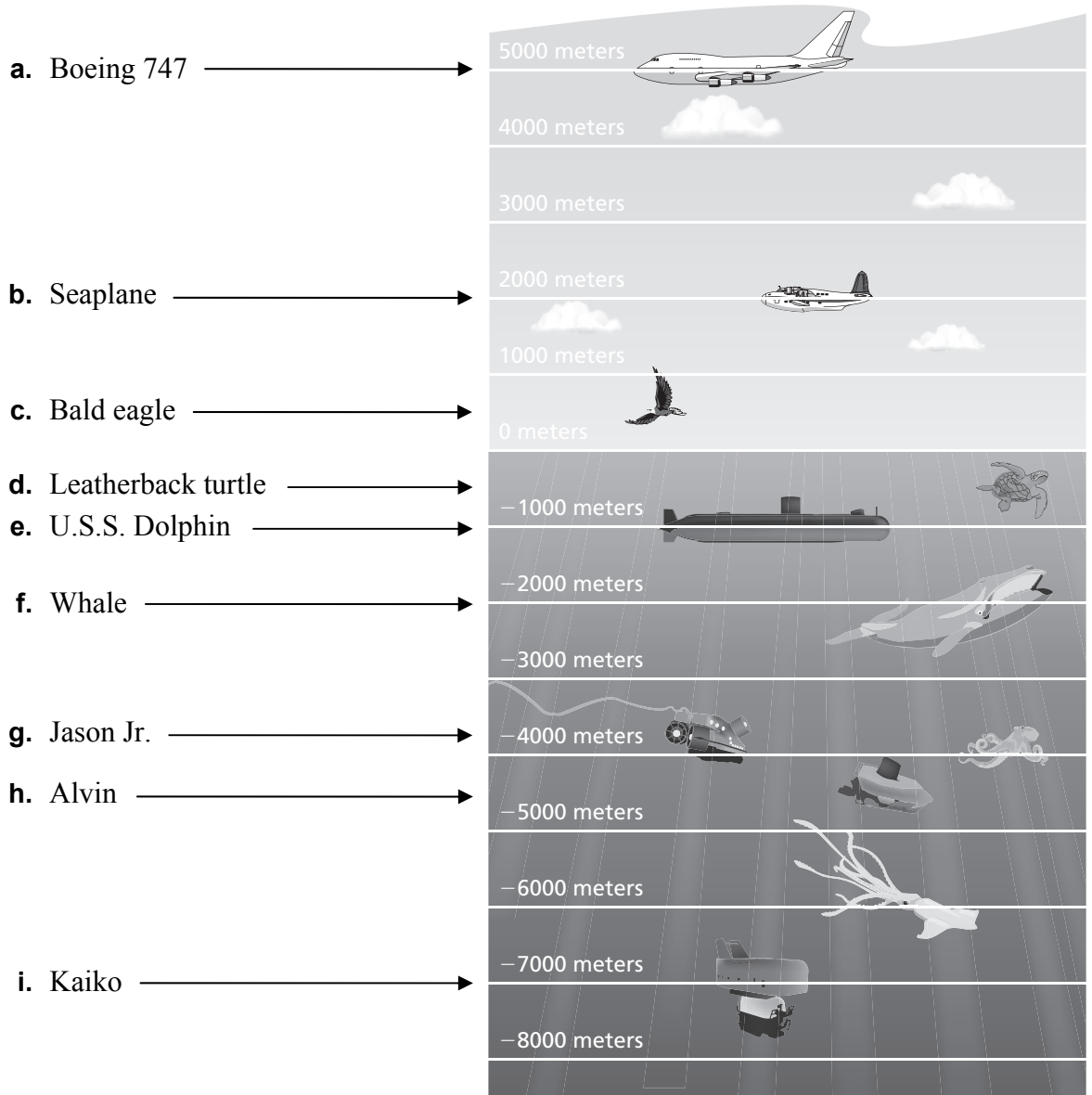**9.** An archaeologist discovers two artifacts. Compare the positions of the artifacts.

Ground Level

−38 cm

$-44\dfrac{3}{5}$ cm

Name_____ Date _____

6.4 Absolute Value
For use with Activity 6.4

Essential Question How can you describe how far an object is from sea level?

1 ACTIVITY: Sea Level

Work with a partner. Write an integer that represents the elevation of each object. How far is each object from sea level? Explain your reasoning.

a. Boeing 747 ———————→   5000 meters

4000 meters

3000 meters

2000 meters

b. Seaplane ——————————→

1000 meters

c. Bald eagle ——————————→

0 meters

d. Leatherback turtle ——————→

−1000 meters

e. U.S.S. Dolphin ——————→

−2000 meters

f. Whale ——————————→

−3000 meters

g. Jason Jr. ——————————→   −4000 meters

h. Alvin ————————————→   −5000 meters

−6000 meters

−7000 meters

i. Kaiko ——————————→

−8000 meters

6.4 **Absolute Value** (continued)

2 **ACTIVITY:** Finding a Distance

Work with a partner. Use the diagram in Activity 1.

    a. What integer represents sea level?

    b. The vessel *Kaiko* ascends to the same depth as the U.S.S. *Dolphin*. About how many meters did *Kaiko* travel? Explain how you found your answer.

    c. The vessel *Jason Jr.* descends to the same depth as the *Alvin*. About how many meters did *Jason Jr.* travel? Explain how you found your answer.

    d. **REASONING** Which pairs of objects are the same distance from sea level? How do you know?

    e. **REASONING** An airplane is the same distance from sea level as the *Kaiko*. How far is the airplane from sea level?

6.4 **Absolute Value** (continued)

3 **ACTIVITY:** Oceanography Project

Work with a partner. Use the Internet or some other resource to write a report that describes two ways in which mathematics is used in oceanography.

Here are two possible ideas. You can use one or both of these, or you can use other ideas.

Diving Bell
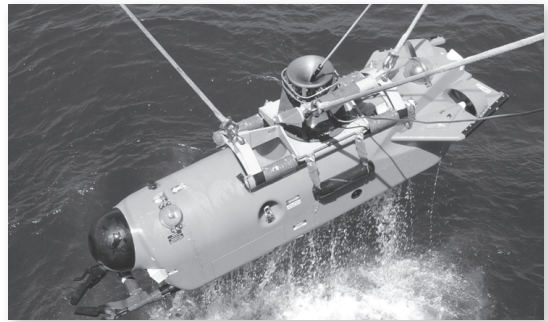
Mine Neutralization Vehicle

What Is Your Answer?

4. **IN YOUR OWN WORDS** How can you describe how far an object is from sea level?

5. **PRECISION** In Activity 1, an object has an elevation of -7500 meters. Is -7500 greater than or less than -7000? Does this object have a depth greater than or less than 7000 meters? Explain your reasoning.

Name _____ Date _____

Find the absolute value.

1. $\left|-5\right|$

2. $\left|7\right|$

3. $\left|0\right|$

4. $\left|-31\right|$

Complete the statement using <, >, or =.

5. 7 _____ $\left|-4\right|$

6. -9 _____ $\left|-10\right|$

7. $\left|8\right|$ _____ $\left|-8\right|$

Order the values from least to greatest.

8. $0, -5, \left|-6\right|, \left|-2\right|, 4$

9. $\left|-12\right|, -21, \left|25\right|, \left|-31\right|, -14, 33$

10. You go to a store in a mall that is on the fourth floor above the main level. Your friend goes to a store that is two floors below the main level.

    a. Write an integer for the position of each person relative to the main level.

    b. Find the absolute value of each integer.

    c. Who is farther from the main level? Explain.

6.5 The Coordinate Plane
For use with Activity 6.5

Essential Question How can you graph and locate points that contain negative numbers in a coordinate plane?

---

1 **ACTIVITY:** Forming the Entire Coordinate Plane

Work with a partner.

a. In the middle of a sheet of grid paper, construct a horizontal number line. Label the tick marks. On a different sheet of grid paper, construct and label a similar vertical number line.

b. Cut out the vertical number line and tape it on top of the horizontal number line so that the zeros overlap. Make sure the number lines are perpendicular to one another. How many regions did you form by doing this?

c. **REASONING** What ordered pair represents the point where the number lines intersect? Why do you think this point is called the *origin*? Explain.

---

2 **ACTIVITY:** Describing Points in the Coordinate Plane

Work with a partner. Use your perpendicular number lines from Activity 1.

a. Plot and label (3, 2) in your coordinate plane. Shade this region in your coordinate plane. What do you notice about the integers along the number lines that surround (3, 2)?

b. Can you plot a point in your coordinate plane so that it is surrounded by negative numbers on the axes? If so, where is this point? Use a different color to shade this region in your coordinate plane.

c. What do you notice about the integers along the number lines for points in the regions that are not shaded?

6.5   **The Coordinate Plane** (continued)

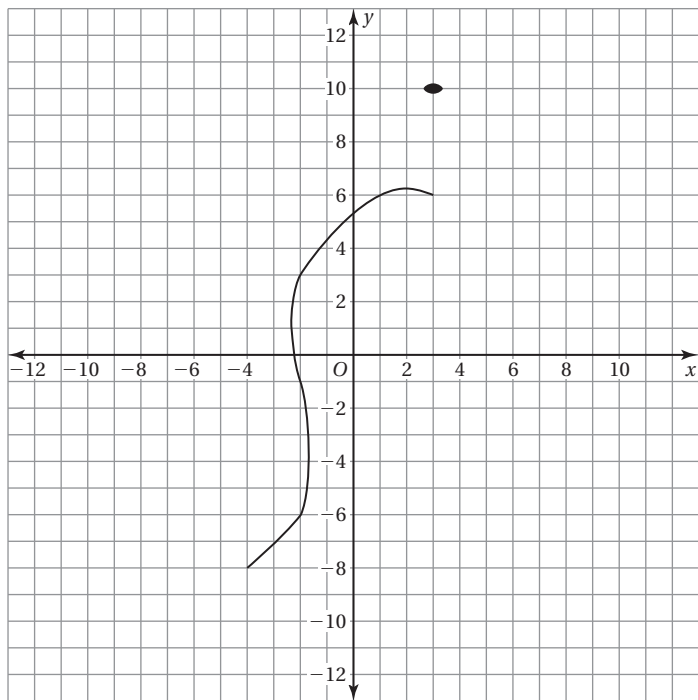   **d.** **STRUCTURE** Describe how you would plot (−3, −2). How is plotting this point similar to plotting (3, 2)? Plot (−3, −2) in your coordinate plane.

    e. **REASONING** Where in your coordinate plane do you plot (2, −4)? Where do you plot (−2, 4)? Explain your reasoning.

3 **ACTIVITY:** Plotting Points in a Coordinate Plane

Work with a partner. Plot and connect the points to make a picture. Describe and color the picture when you are done.

1(6, 9)	**2**(4, 11)	**3**(2, 12)	**4**(0, 11)	**5**(−2, 9)
6(−6, 2)	**7**(−9, 1)	**8**(−11, −3)	**9**(−7, 0)	**10**(−5, −1)
11(−5, −5)	**12**(−4, −8)	**13**(−6, −10)	**14**(−3, −9)	**15**(−3, −10)
16(−4, −11)	**17**(−4, −12)			
18(−3, −11)	**19**(−2, −12)			
20(−2, −11)	**21**(−1, −12)			
22(−1, −11)	**23**(−2, −10)			
24(−2, −9)	**25**(1, −9)			
26(2, −8)	**27**(2, −10)			
28(1, −11)	**29**(1, −12)			
30(2, −11)	**31**(3, −12)			
32(3, −11)	**33**(4, −12)			
34(4, −11)	**35**(3, −10)			
36(3, −8)	**37**(4, −6)			
38(6, 0)	**39**(9, −3)			
40(9, −1)	**41**(8, 1)			
42(5, 3)	**43**(3, 6)			
44(3, 7)	**45**(4, 8)			

Name_____ Date _____

What Is Your Answer?

4. **IN YOUR OWN WORDS** How can you graph and locate points that contain negative numbers in a coordinate plane?

5. Make up your own "dot-to-dot" picture. Use at least 20 points. Your picture should have at least two points in each quadrant.

Name _____ Date _____
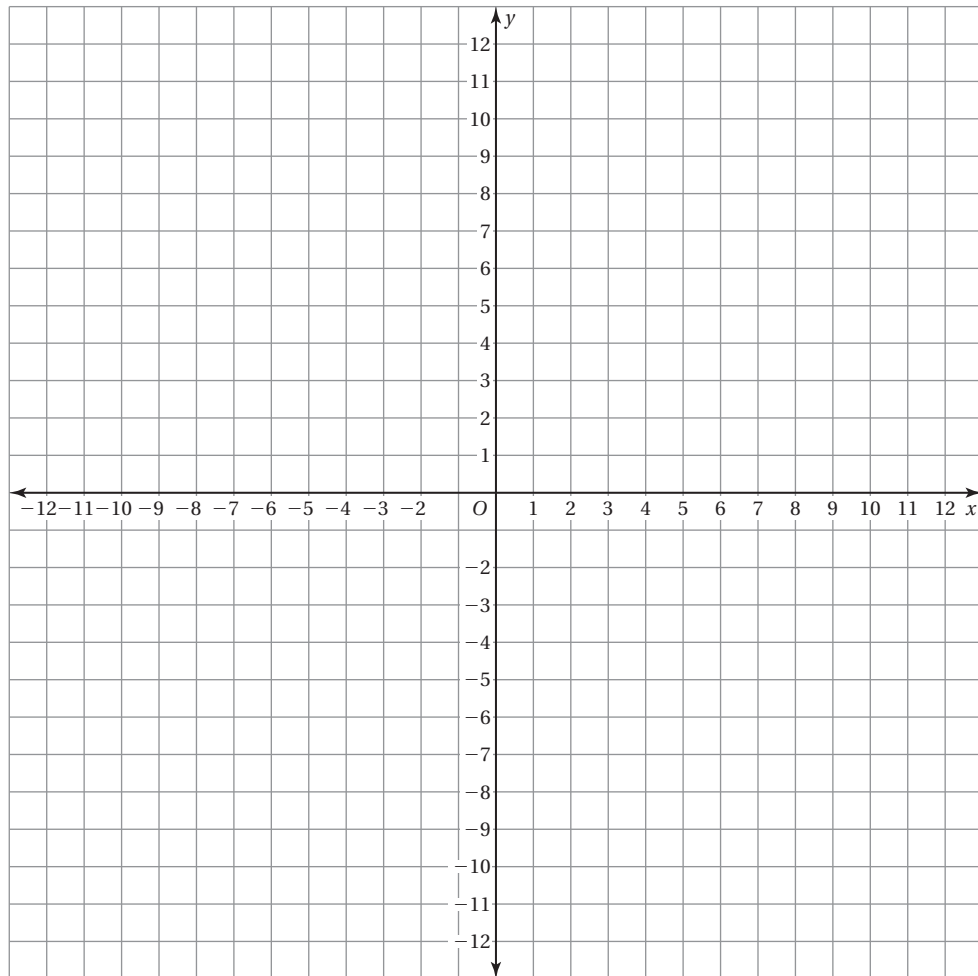
6.5 Practice
For use after Lesson 6.5

Plot the ordered pair in the coordinate plane. Describe the location of the point.
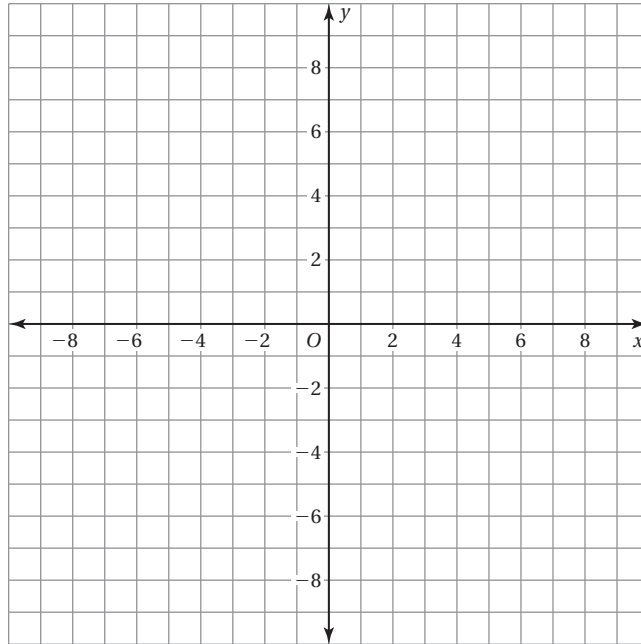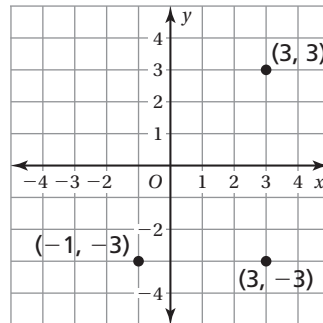
1. $A(8, 4)$

2. $B(-3, 5)$

3. $C(-2, -2)$

4. $D(4, -7)$

5. $E(-6, -5)$

6. $F(-9, 7)$

7. The coordinates of three vertices of a rectangle are shown in the figure. What are the coordinates of the fourth vertex?

8. Your house is located at $(-4, 3)$, which is 4 blocks west and 3 blocks north of the center of town. To get from your house to the mall, you walk 7 blocks east and 4 blocks south.

  a. What ordered pair corresponds to the location of the mall?

  b. Is your house or the mall closer to the center of town? Explain.

Name_____ Date _____

Practice

For use after Extension 6.5

Reflect the point in (a) the *x*-axis and (b) the *y*-axis.

1. $(2, 4)$

2. $(-3, 1)$

3. $(-4, -1)$

4. $(2, -3)$

5. $(0, -2)$

6. $(-1, 0)$

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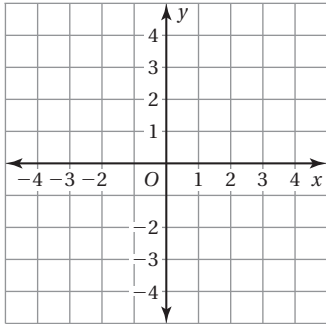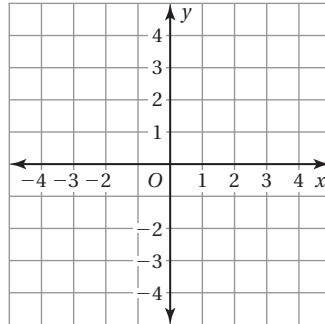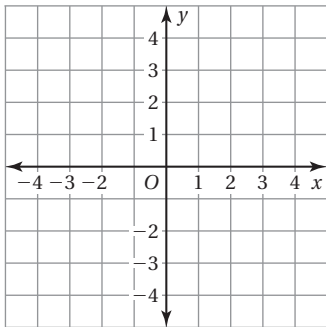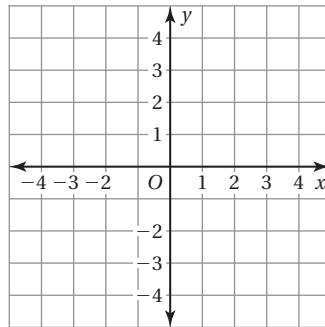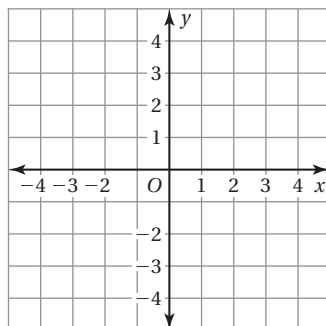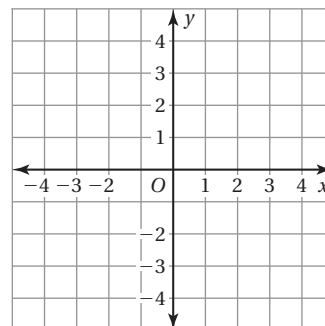
Reflect the point in the *x*-axis followed by the *y*-axis.
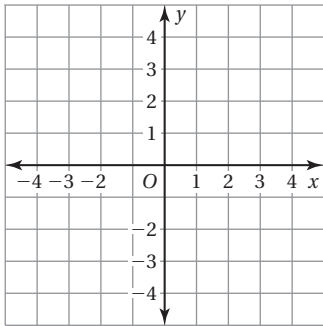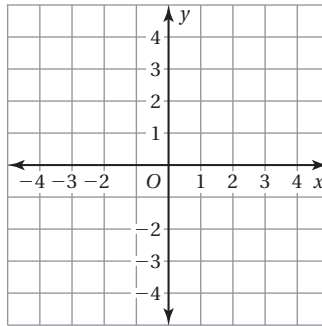
7. $(2, 2)$
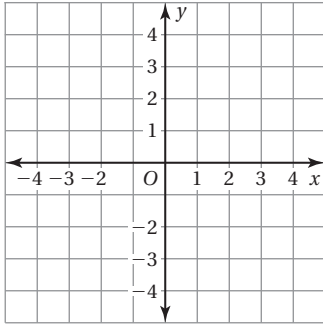
8. $(-4, 3)$
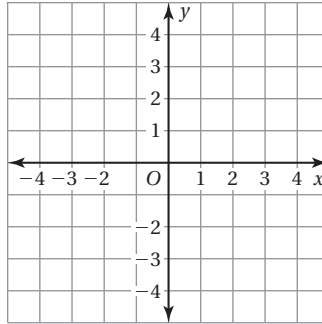
9. $(-1.5, -1.5)$

10. $(3.5, -3.5)$

11. The vertices of a triangle are $(2, 2)$, $(4, 4)$, and $(4, 2)$. Reflect the triangle in the *y*-axis. Give the coordinates of the reflected triangle.