

A Story of Ratios[®]

Eureka Math[™]

Grade 6, Module 3

Student File_B

*Contains Exit Ticket,
and Assessment Materials*

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Exit Ticket Packet

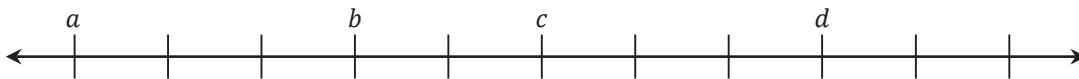
Name _____

Date _____

Lesson 1: Positive and Negative Numbers on the Number Line— Opposite Direction and Value

Exit Ticket

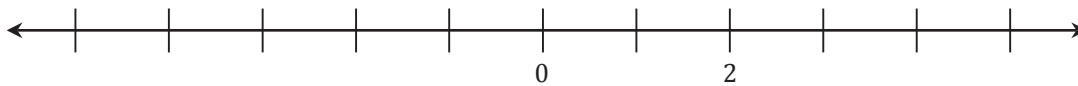
1. If zero lies between a and d , give one set of possible values for a , b , c , and d .



2. Below is a list of numbers in order from least to greatest. Use what you know about the number line to complete the list of numbers by filling in the blanks with the missing integers.

$-6, -5, \underline{\hspace{1cm}}, -3, -2, -1, \underline{\hspace{1cm}}, 1, 2, \underline{\hspace{1cm}}, 4, \underline{\hspace{1cm}}, 6$

3. Complete the number line scale. Explain and show how to find 2 and the opposite of 2 on a number line.



Name _____

Date _____

Lesson 2: Real-World Positive and Negative Numbers and Zero

Exit Ticket

1. Write a story problem that includes both integers -8 and 12 .

2. What does zero represent in your story problem?

3. Choose an appropriate scale to graph both integers on the vertical number line. Label the scale.

4. Graph both points on the vertical number line.



Name _____

Date _____

Lesson 3: Real-World Positive and Negative Numbers and Zero

Exit Ticket

1. Write a story problem using sea level that includes both integers -110 and 120 .

2. What does zero represent in your story problem?

3. Choose an appropriate scale to graph both integers on the vertical number line.

4. Graph and label both points on the vertical number line.



Name _____

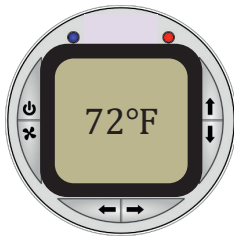
Date _____

Lesson 4: The Opposite of a Number

Exit Ticket

In a recent survey, a magazine reported that the preferred room temperature in the summer is 68°F . A wall thermostat, like the ones shown below, tells a room's temperature in degrees Fahrenheit.

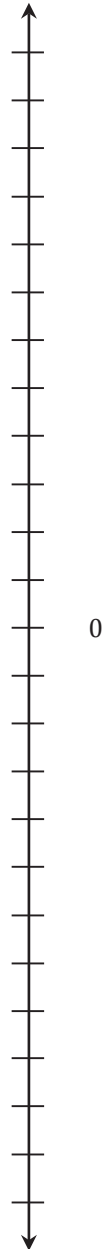
Sarah's Upstairs Bedroom



Downstairs Bedroom



- Which bedroom is warmer than the recommended room temperature?
- Which bedroom is cooler than the recommended room temperature?
- Sarah notices that her room's temperature is 4°F above the recommended temperature, and the downstairs bedroom's temperature is 4°F below the recommended temperature. She graphs 72 and 64 on a vertical number line and determines they are opposites. Is Sarah correct? Explain.
- After determining the relationship between the temperatures, Sarah now decides to represent 72°F as 4 and 64°F as -4 and graphs them on a vertical number line. Graph 4 and -4 on the vertical number line on the right. Explain what zero represents in this situation.



Name _____

Date _____

Lesson 5: The Opposite of a Number's Opposite

Exit Ticket

1. Jane completes several example problems that ask her to find the opposite of the opposite of a number, and for each example, the result is a positive number. Jane concludes that when she takes the opposite of the opposite of any number, the result will always be positive. Is Jane correct? Why or why not?

2. To support your answer from the previous question, create an example, written as an equation. Illustrate your example on the number line below.



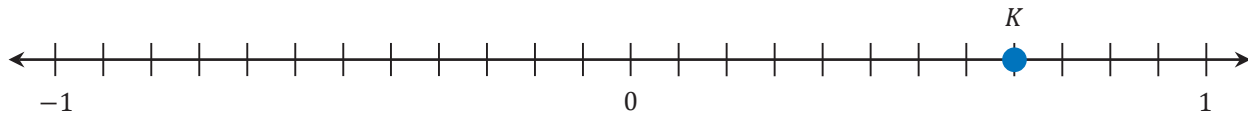
Name _____

Date _____

Lesson 6: Rational Numbers on the Number Line

Exit Ticket

Use the number line diagram below to answer the following questions.



1. What is the length of each segment on the number line?
2. What number does point K represent?
3. What is the opposite of point K ?
4. Locate the opposite of point K on the number line, and label it point L .
5. In the diagram above, zero represents the location of Martin Luther King Middle School. Point K represents the library, which is located to the east of the middle school. In words, create a real-world situation that could represent point L , and describe its location in relation to 0 and point K .

Name _____

Date _____

Lesson 7: Ordering Integers and Other Rational Numbers

Exit Ticket

In math class, Christina and Brett are debating the relationship between two rational numbers. Read their claims below, and then write an explanation of who is correct. Use a number line model to support your answer.

Christina's Claim: "I know that 3 is greater than $2\frac{1}{2}$. So, -3 must be greater than $-2\frac{1}{2}$."

Brett's Claim: "Yes, 3 is greater than $2\frac{1}{2}$, but when you look at their opposites, their order will be opposite. So, that means $-2\frac{1}{2}$ is greater than -3 ."

Name _____

Date _____

Lesson 8: Ordering Integers and Other Rational Numbers

Exit Ticket

Order the following set of rational numbers from least to greatest, and explain how you determined the order.

$$-3, 0, -\frac{1}{2}, 1, -3\frac{1}{3}, 6, 5, -1, \frac{21}{5}, 4$$

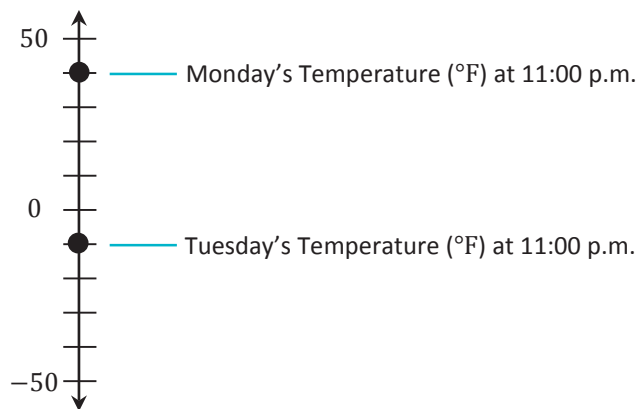
Name _____

Date _____

Lesson 9: Comparing Integers and Other Rational Numbers

Exit Ticket

1. Interpret the number line diagram shown below, and write a statement about the temperature for Tuesday compared to Monday at 11:00 p.m.



2. If the temperature at 11:00 p.m. on Wednesday is warmer than Tuesday's temperature but still below zero, what is a possible value for the temperature at 11:00 p.m. Wednesday?

Name _____

Date _____

Lesson 10: Writing and Interpreting Inequality Statements

Involving Rational Numbers

Exit Ticket

Kendra collected data for her science project. She surveyed people asking them how many hours they sleep during a typical night. The chart below shows how each person's response compares to 8 hours (which is the answer she expected most people to say).

Name	Number of Hours (usually slept each night)	Compared to 8 Hours
Frankie	8.5	0.5
Mr. Fields	7	-1.0
Karla	9.5	1.5
Louis	8	0
Tiffany	$7\frac{3}{4}$	$-\frac{1}{4}$

- a. Plot and label each of the numbers in the right-most column of the table above on the number line below.



- b. List the numbers from least to greatest.
- c. Using your answer from part (b) and inequality symbols, write one statement that shows the relationship among all of the numbers.

Name _____

Date _____

Lesson 11: Absolute Value—Magnitude and Distance

Exit Ticket

Jessie and his family drove up to a picnic area on a mountain. In the morning, they followed a trail that led to the mountain summit, which was 2,000 feet above the picnic area. They then returned to the picnic area for lunch. After lunch, they hiked on a trail that led to the mountain overlook, which was 3,500 feet below the picnic area.

- a. Locate and label the elevation of the mountain summit and mountain overlook on a vertical number line. The picnic area represents zero. Write a rational number to represent each location.

Picnic area: 0

Mountain summit:

Mountain overlook:

- b. Use absolute value to represent the distance on the number line of each location from the picnic area.

Distance from the picnic area to the mountain summit:

Distance from the picnic area to the mountain overlook:

- c. What is the distance between the elevations of the summit and overlook? Use absolute value and your number line from part (a) to explain your answer.



Name _____

Date _____

Lesson 12: The Relationship Between Absolute Value and Order

Exit Ticket

- Bethany writes a set of rational numbers in increasing order. Her teacher asks her to write the absolute values of these numbers in increasing order. When her teacher checks Bethany's work, she is pleased to see that Bethany has not changed the order of her numbers. Why is this?
- Mason was ordering the following rational numbers in math class: -3.3 , -15 , $-8\frac{8}{9}$.
 - Order the numbers from least to greatest.
 - List the order of their absolute values from least to greatest.
 - Explain why the orderings in parts (a) and (b) are different.

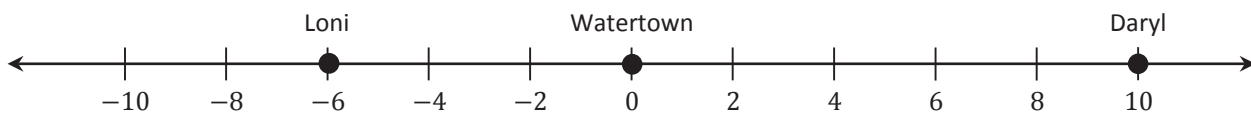
Name _____

Date _____

Lesson 13: Statements of Order in the Real World

Exit Ticket

1. Loni and Daryl call each other from different sides of Watertown. Their locations are shown on the number line below using miles. Use absolute value to explain who is a farther distance (in miles) from Watertown. How much closer is one than the other?



2. Claude recently read that no one has ever scuba dived more than 330 meters below sea level. Describe what this means in terms of elevation using sea level as a reference point.

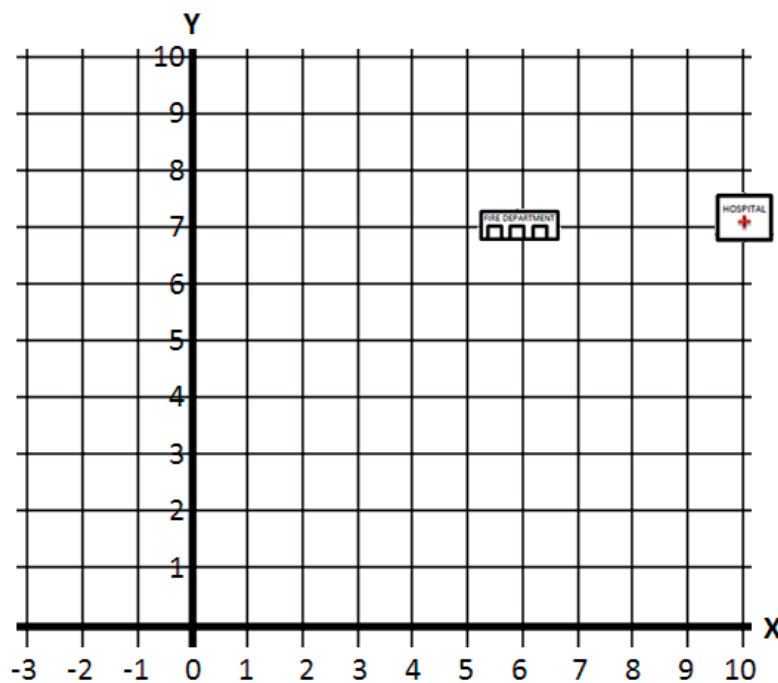
Name _____

Date _____

Lesson 14: Ordered Pairs

Exit Ticket

- On the map below, the fire department and the hospital have one matching coordinate. Determine the proper order of the ordered pairs in the map, and write the correct ordered pairs for the locations of the fire department and hospital. Indicate which of their coordinates are the same.



- On the map above, locate and label the locations of each description below:
 - The local bank has the same first coordinate as the fire department, but its second coordinate is half of the fire department's second coordinate. What ordered pair describes the location of the bank? Locate and label the bank on the map using point B .
 - The Village Police Department has the same second coordinate as the bank, but its first coordinate is -2 . What ordered pair describes the location of the Village Police Department? Locate and label the Village Police Department on the map using point P .

Name _____

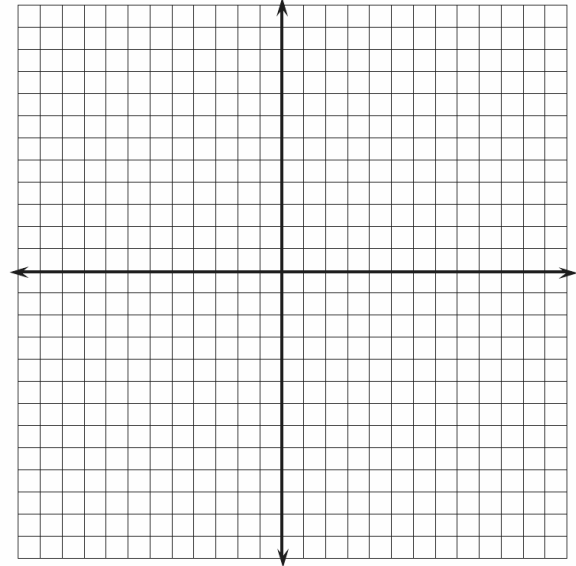
Date _____

Lesson 15: Locating Ordered Pairs on the Coordinate Plane

Exit Ticket

1. Label the second quadrant on the coordinate plane, and then answer the following questions:

- Write the coordinates of one point that lies in the second quadrant of the coordinate plane.
- What must be true about the coordinates of any point that lies in the second quadrant?



2. Label the third quadrant on the coordinate plane, and then answer the following questions:

- Write the coordinates of one point that lies in the third quadrant of the coordinate plane.
- What must be true about the coordinates of any point that lies in the third quadrant?

3. An ordered pair has coordinates that have the same sign. In which quadrant(s) could the point lie? Explain.

4. Another ordered pair has coordinates that are opposites. In which quadrant(s) could the point lie? Explain.

Name _____

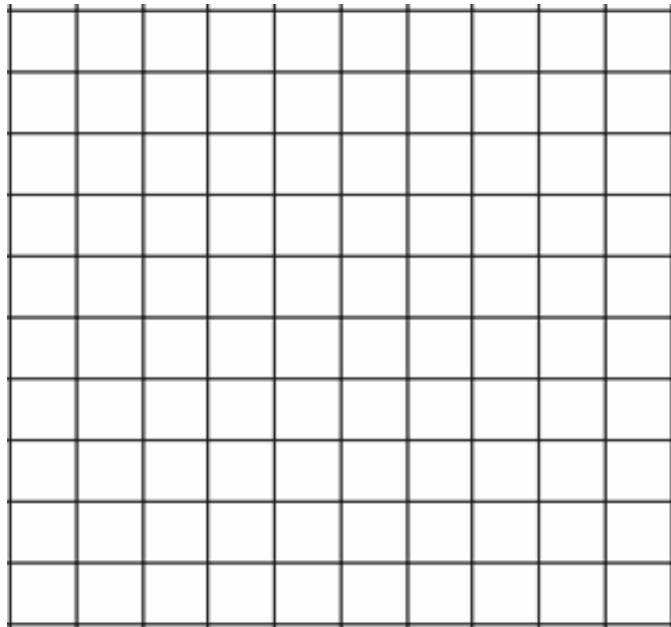
Date _____

Lesson 17: Drawing the Coordinate Plane and Points on the Plane

Exit Ticket

Determine an appropriate scale for the set of points given below. Draw and label the coordinate plane, and then locate and label the set of points.

$$\{(10, 0.2), (-25, 0.8), (0, -0.4), (20, 1), (-5, -0.8)\}$$



Name _____

Date _____

Lesson 18: Distance on the Coordinate Plane

Exit Ticket

Determine whether each given pair of end points lies on the same horizontal or vertical line. If so, find the length of the line segment that joins the pair of points. If not, explain how you know the points are not on the same horizontal or vertical line.

a. $(0, -2)$ and $(0, 9)$

b. $(11, 4)$ and $(2, 11)$

c. $(3, -8)$ and $(3, -1)$

d. $(-4, -4)$ and $(5, -4)$

Assessment Packet

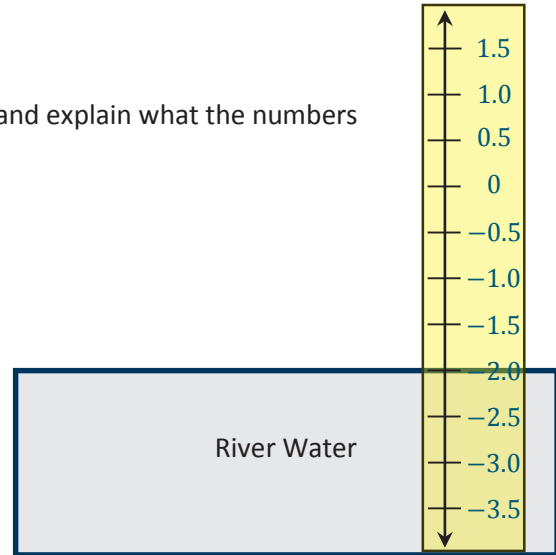
Name _____

Date _____

1. The picture below is a flood gauge that is used to measure how far (in feet) a river's water level is above or below its normal level.

- a. Explain what the number 0 on the gauge represents, and explain what the numbers above and below 0 represent.

- b. Describe what the picture indicates about the river's current water level.

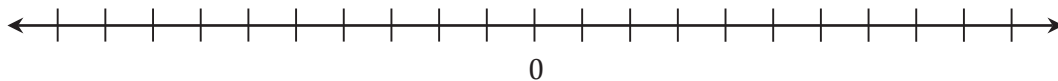


- c. What number represents the opposite of the water level shown in the picture, and where is it located on the gauge? What would it mean if the river water was at that level?
- d. If heavy rain is in the forecast for the area for the next 24 hours, what reading might you expect to see on this gauge tomorrow? Explain your reasoning.

2. Isaac made a mistake in his checkbook. He wrote a check for \$8.98 to rent a video game but mistakenly recorded it in his checkbook as an \$8.98 deposit.

a. Represent each transaction with a rational number, and explain the difference between the transactions.

b. On the number line below, locate and label the points that represent the rational numbers listed in part (a). Describe the relationship between these two numbers. Zero on the number line represents Isaac's balance before the mistake was made.

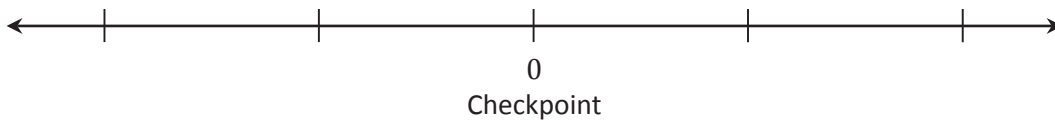


c. Use absolute value to explain how a debit of \$8.98 and a credit of \$8.98 are similar.

3. A local park's programs committee is raising money by holding mountain bike races on a course through the park. During each race, a computer tracks the competitors' locations on the course using GPS tracking. The table shows how far each competitor is from a checkpoint.

Number	Competitor Name	Distance to Checkpoint
223	Florence	0.1 miles before
231	Mary	$\frac{2}{5}$ miles past
240	Rebecca	0.5 miles before
249	Lita	$\frac{1}{2}$ miles past
255	Nancy	$\frac{2}{10}$ miles before

- a. The checkpoint is represented by 0 on the number line. Locate and label points on the number line for the positions of each listed participant. Label the points using rational numbers.



- b. Which of the competitors is closest to the checkpoint? Explain.
- c. Two competitors are the same distance from the checkpoint. Are they in the same location? Explain.
- d. Who is closer to finishing the race, Nancy or Florence? Support your answer.

4. Andr ea and Marta are testing three different coolers to see which keeps the coldest temperature. They placed a bag of ice in each cooler, closed the coolers, and then measured the air temperature inside each after 90 minutes. The temperatures are recorded in the table below:

Cooler	A	B	C
Temperature ($^{\circ}\text{C}$)	-2.91	5.7	-4.3

Marta wrote the following inequality statement about the temperatures:

$$-4.3 < -2.91 < 5.7.$$

Andr ea claims that Marta made a mistake in her statement and that the inequality statement should be written as

$$-2.91 < -4.3 < 5.7.$$

- a. Is either student correct? Explain.
- b. The students want to find a cooler that keeps the temperature inside the cooler more than 3 degrees below the freezing point of water (0°C) after 90 minutes. Indicate which of the tested coolers meets this goal, and explain why.

5. Mary manages a company that has been hired to flatten a plot of land. She took several elevation samples from the land and recorded those elevations below:

Elevation Sample	A	B	C	D	E	F
Elevation (ft. above sea level)	826.5	830.2	832.0	831.1	825.8	827.1

- a. The landowner wants the land flat and at the same level as the road that passes in front of it. The road's elevation is 830 feet above sea level. Describe in words how elevation samples B, C, and E compare to the elevation of the road.

- b. The table below shows how some other elevation samples compare to the level of the road:

Elevation Sample	G	H	I	J	K	L
Elevation (ft. from the road)	3.1	-0.5	2.2	1.3	-4.5	-0.9

Write the values in the table in order from least to greatest.

_____ < _____ < _____ < _____ < _____ < _____

- c. Indicate which of the values from the table in part (b) is farthest from the elevation of the road. Use absolute value to explain your answer.

Name _____

Date _____

1. Mr. Kindle invested some money in the stock market. He tracks his gains and losses using a computer program. Mr. Kindle receives a daily email that updates him on all his transactions from the previous day. This morning, his email read as follows:

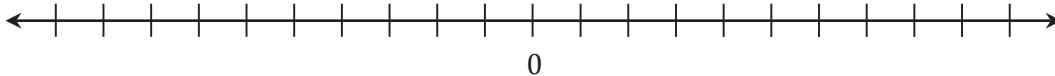
Good morning, Mr. Kindle,

Yesterday's investment activity included a loss of \$800, a gain of \$960, and another gain of \$230. Log in now to see your current balance.

- a. Write an integer to represent each gain and loss.

Description	Integer Representation
Loss of \$800	
Gain of \$960	
Gain of \$230	

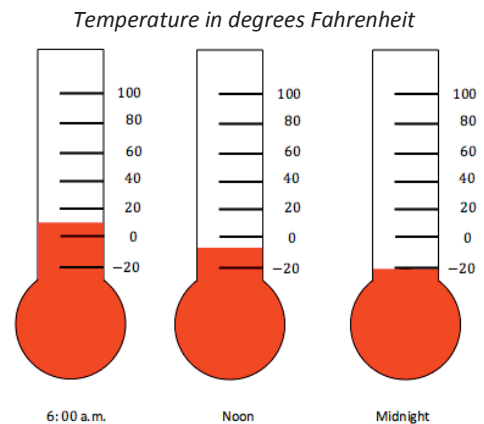
- b. Mr. Kindle noticed that an error had been made on his account. The “loss of \$800” should have been a “gain of \$800.” Locate and label both points that represent “a loss of \$800” and “a gain of \$800” on the number line below. Describe the relationship of these two numbers when zero represents no change (gain or loss).



- c. Mr. Kindle wanted to correct the error, so he entered $-(-\$800)$ into the program. He made a note that read, “The opposite of the opposite of \$800 is \$800.” Is his reasoning correct? Explain.

2. At 6:00 a.m., Buffalo, NY, had a temperature of 10°F . At noon, the temperature was -10°F , and at midnight, it was -20°F .

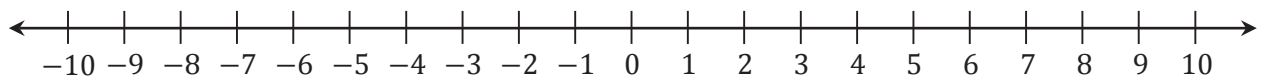
- a. Write a statement comparing -10°F and -20°F .



- b. Write an inequality statement that shows the relationship between the three recorded temperatures. Which temperature is the warmest?

- c. Explain how to use absolute value to find the number of degrees below zero the temperature was at noon.
- d. In Peekskill, NY, the temperature at 6:00 a.m. was -12°F . At noon, the temperature was the exact opposite of Buffalo's temperature at 6:00 a.m. At midnight, a meteorologist recorded the temperature as -6°F in Peekskill. He concluded that "For temperatures below zero, as the temperature increases, the absolute value of the temperature decreases." Is his conclusion valid? Explain and use a vertical number line to support your answer.

3. Choose an integer between 0 and -5 on a number line, and label the point P . Locate and label each of the following points and their values on the number line.



- a. Label point A : the opposite of point P .
- b. Label point B : a number less than point P .
- c. Label point C : a number greater than point P .
- d. Label point D : a number halfway between point P and the integer to the right of point P .

4. Julia is learning about elevation in math class. She decided to research some facts about New York State to better understand the concept. Here are some facts that she found.

- *Mount Marcy is the highest point in New York State. It is 5,343 feet above sea level.*
- *Lake Erie is 210 feet below sea level.*
- *The elevation of Niagara Falls, NY, is 614 feet above sea level.*
- *The lobby of the Empire State Building is 50 feet above sea level.*
- *New York State borders the Atlantic Coast, which is at sea level.*
- *The lowest point of Cayuga Lake is 435 feet below sea level.*

- a. Write an integer that represents each location in relationship to sea level.

Mount Marcy _____

Lake Erie _____

Niagara Falls, NY _____

Empire State Building _____

Atlantic Coast _____

Cayuga Lake _____

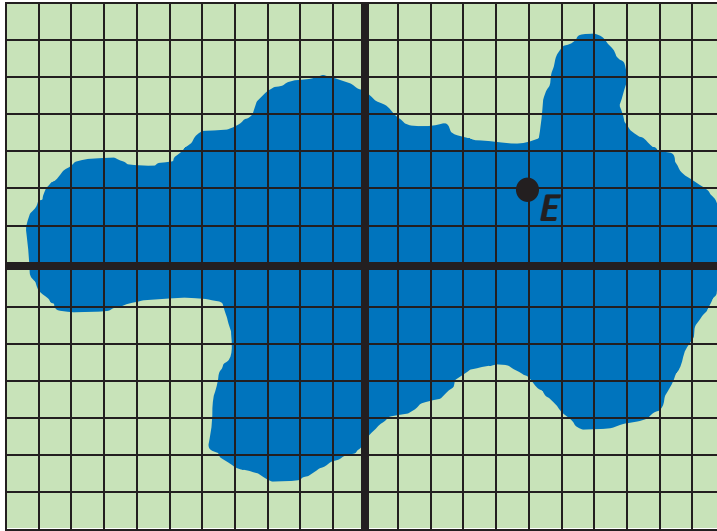
- b. Explain what negative and positive numbers tell Julia about elevation.

- c. Order the elevations from least to greatest, and then state their absolute values. Use the chart below to record your work.

Elevations	Absolute Values of Elevations

- d. Circle the row in the table that represents sea level. Describe how the order of the elevations below sea level compares to the order of their absolute values. Describe how the order of the elevations above sea level compares to the order of their absolute values.

5. For centuries, a mysterious sea serpent has been rumored to live at the bottom of Mysterious Lake. A team of historians used a computer program to plot the last five positions of the sightings.



- Locate and label the locations of the last four sightings: $A\left(-9\frac{1}{2}, 0\right)$, $B(-3, -4.75)$, $C(9, 2)$, and $D(8, -2.5)$.
- Over time, most of the sightings occurred in Quadrant III. Write the coordinates of a point that lies in Quadrant III.
- What is the distance between point A and the point $\left(9\frac{1}{2}, 0\right)$? Show your work to support your answer.
- What are the coordinates of point E on the coordinate plane?
- Point F is related to point E . Its x -coordinate is the same as point E 's, but its y -coordinate is the opposite of point E 's. Locate and label point F . What are the coordinates? How far apart are points E and F ? Explain how you arrived at your answer.