

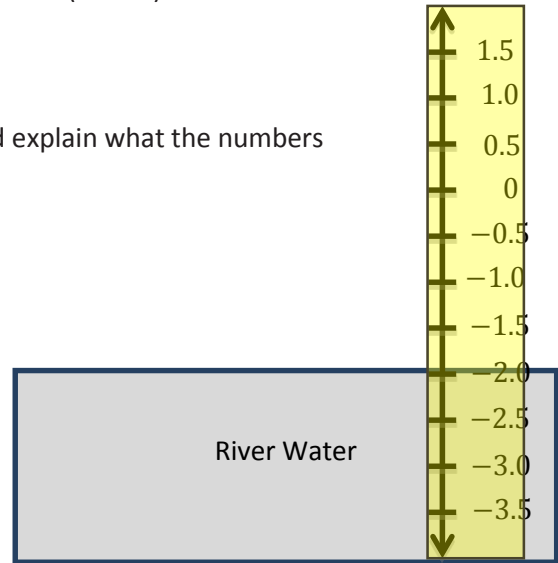
Name \_\_\_\_\_

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.

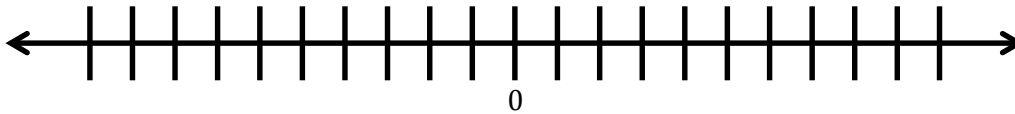
b. Describe what the picture indicates about the river’s current water level.



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.

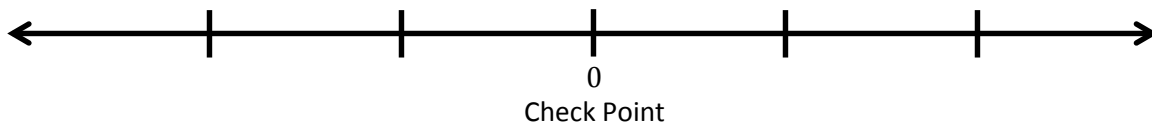


- c. Use absolute value to explain how a debit of \$8.98 and a credit of \$8.98 are similar.

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 check point.

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

- a. The check point 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 check point? Explain.
- c. Two competitors are the same distance from the check point. Are they in the same location? Explain.
- d. Who is closer to finishing the race, Nancy or Florence? Support your answer.

4. Andréa 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:

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

Andréa 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 ( $0^{\circ}\text{C}$ ) 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 (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.