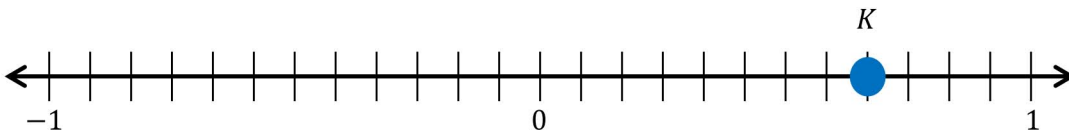Name _____   Date_____

Rational Numbers on the Number Line

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.
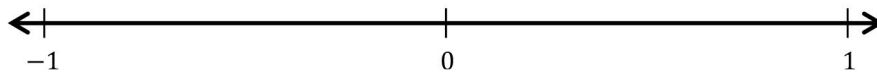
1. Write the opposite of each number.

   a. $\dfrac{10}{7}$

   b. $-\dfrac{5}{3}$

   c. 3.82

   d. $-6\dfrac{1}{2}$

2. Choose a non-integer between 0 and 1. Label it point A and its opposite point B on the number line. Write values below the points.

   a. To draw a scale that would include both points, what could be the length of each segment?

   b. In words, create a real-world situation that could represent the number line diagram.

3. Choose a value for point P that is between -6 and -7.

   a. What is the opposite of P?

   b. Use the value from part (a), and describe its location on the number line in relation to zero.

   c. Find the opposite of the opposite of point P. Show your work and explain your reasoning.

4. Locate and label each point on the number line. Use the diagram to answer the questions.

   Jill lives one block north of the pizza shop.

   *Janette's house is $\dfrac{1}{3}$ block past Jill's house.*

   Jeffrey and Olivia are in the park $\dfrac{4}{3}$ blocks south of the pizza shop.

   Jenny's Jazzy Jewelry Shop is located halfway between the pizza shop and the park.

   a. Describe an appropriate scale to show all the points in this situation.

   b. What number represents the location of Jenny's Jazzy Jewelry Shop? Explain your reasoning.

Use the number line diagram below to answer the following questions.
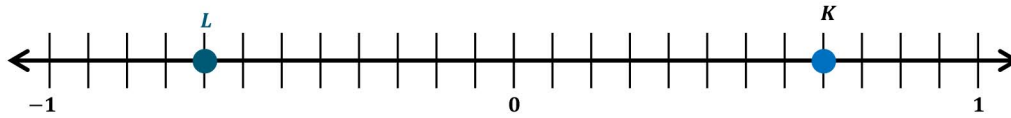
1. What is the length of each segment on the number line?

   $\frac{1}{12}$

2. What number does point K represent?

   $\frac{8}{12}$, or $\frac{2}{3}$

3. What is the opposite of point K?

   $-\frac{8}{12}$, or $-\frac{2}{3}$

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.

   Answers may vary. Point L is $\frac{8}{12}$ units to the left of 0, so it is a negative number. Point L represents the recreation center which is located $\frac{8}{12}$ mile west of Martin Luther King Middle School. This means that the recreation center and library are the same distance from the middle school but in opposite directions because the opposite of $\frac{8}{12}$ is $-\frac{8}{12}$.

Students gain additional practice with graphing rational numbers on the number line.

1. In the space provided, write the opposite of each number.

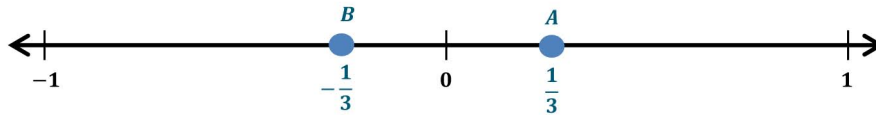   a. $\frac{10}{7}$ $-\frac{10}{7}$

   b. $-\frac{5}{3}$ $\frac{5}{3}$

   c. 3.82 -3.82

   d. $-6\frac{1}{2}$ $6\frac{1}{2}$

2. Choose a non-integer between 0 and 1. Label it point A and its opposite point B on the number line. Write values below the points.

(Answers may vary.)

   a. To draw a scale that would include both points, what could be the length of each segment?

   Answers may vary. $\frac{1}{3}$

   b. In words, create a real-world situation that could represent the number line diagram.

   Answers may vary. Starting at home, I ran $\frac{1}{3}$ mile. My brother ran $\frac{1}{3}$ mile from home in the opposite direction.

3. Choose a value for point P that is between -6 and -7.

Answers may vary. $-\frac{13}{2}, -6.25, -6.8$

   a. What is the opposite of P?

   Answers may vary. $\frac{13}{2}, 6.25, 6.8$

   b. Use the value from part (a), and describe its location on the number line in relation to zero.

   $\frac{13}{2}$ *is the same distance as* $-\frac{13}{2}$ *from zero but to the right.* $\frac{13}{2}$ *is* $6\frac{1}{2}$ *units to the right of (or above) zero.*

   c. Find the opposite of the opposite of point P. Show your work and explain your reasoning.

   The opposite of an opposite of the number is the original number. If P is located at $-\frac{13}{2}$*, then the opposite of the opposite of P is located at* $-\frac{13}{2}$*. The opposite of* $-\frac{13}{2}$ *is* $\frac{13}{2}$*. The opposite of* $\frac{13}{2}$ *is* $-\frac{13}{2}$*.*

$$-\left(-\frac{13}{2}\right) = \frac{13}{2} \text{ or } -\left(-\left(-\frac{13}{2}\right)\right) = -\frac{13}{2}$$

4. Locate and label each point on the number line. Use the diagram to answer the questions.

Jill lives one block north of the pizza shop.

Janette's house is $\frac{1}{3}$ block past Jill's house.

Jeffrey and Olivia are in the park $\frac{4}{3}$ blocks south of the pizza shop.

Jenny's Jazzy Jewelry Shop is located halfway between the pizza shop and the park.

— Janette's house
— Jill's house

0 — Pizza shop

— Jewelry Shop

— Park

a. Describe an appropriate scale to show all the points in this situation.

An appropriate scale would be $\frac{1}{3}$ because the numbers given in the example all have denominators of 3. I would divide the number line by equal segments of $\frac{1}{3}$.

b. What number represents the location of Jenny's Jazzy Jewelry Shop? Explain your reasoning.

The number is $-\frac{2}{3}$. I got my answer by finding the park first. It is 4 units below 0. Since the jewelry shop is halfway between the pizza shop and

the park, half of 4 is 2. Then I moved 2 units down on the number line since the shop is south of the pizza shop before the park.