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Lesson 6: Rational Numbers on the Number Line

Classwork

Opening Exercise

- a. Write the decimal equivalent of each fraction.

i. $\frac{1}{2} = 0.5$

ii. $\frac{4}{5} = 0.8$

iii. $6\frac{7}{10} = 6.70$

- b. Write the fraction equivalent of each decimal.

i. $0.42 = \frac{42}{100} = \frac{21}{50}$

ii. $3.75 = 3\frac{3}{4}$

iii. $36.90 = 36\frac{9}{10}$

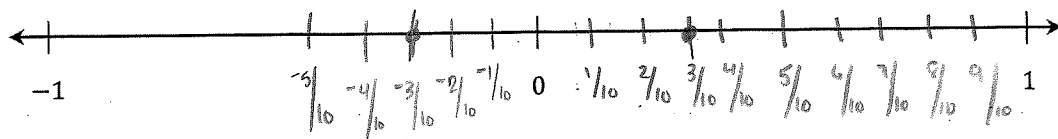
Example 1: Graphing Rational Numbers

If b is a nonzero whole number, then the unit fraction $\frac{1}{b}$ is located on the number line by dividing the segment between 0 and 1 into b segments of equal length. One of the b segments has 0 as its left end point; the right end point of this segment corresponds to the unit fraction $\frac{1}{b}$.

The fraction $\frac{a}{b}$ is located on the number line by joining a segments of length $\frac{1}{b}$ so that (1) the left end point of the first segment is 0, and (2) the right end point of each segment is the left end point of the next segment. The right end point of the last segment corresponds to the fraction $\frac{a}{b}$.

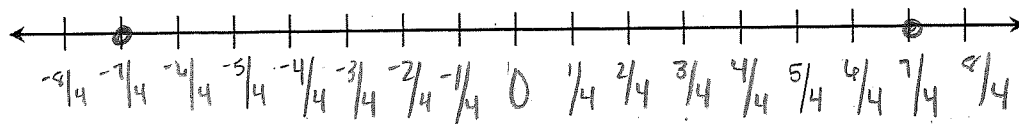
Locate and graph the number $\frac{3}{10}$ and its opposite on a number line.

How would the # fit on a scale?



Exercise 1

Use what you know about the point $-\frac{7}{4}$ and its opposite to graph both points on the number line below. The fraction $-\frac{7}{4}$ is located between which two consecutive integers? Explain your reasoning.



On the number line, each segment will have an equal length of $\frac{1}{4}$. The fraction is located between -1 and -2 .

Explanation:

$\frac{7}{4}$ is the opposite of $-\frac{7}{4}$. It is the same distance from zero but on the opposite side of zero. Since $-\frac{7}{4}$ is to the left of zero, $\frac{7}{4}$ is to the right of zero. The original fraction is located between -2 ($-\frac{8}{4}$) and -1 ($-\frac{4}{4}$).

Example 2: Rational Numbers and the Real World

The water level of a lake rose 1.25 feet after it rained. Answer the following questions using the number line below.

- a. Write a rational number to represent the situation.

1.25 or $1\frac{1}{4}$

- b. What two integers is 1.25 between on a number line?

1 and 2

- c. Write the length of each segment on the number line as a decimal and a fraction.

0.25 and $\frac{1}{4}$

- d. What will be the water level after it rained? Graph the point on the number line.

1.25 feet above the original lake level.

- e. After two weeks have passed, the water level of the lake is now the opposite of the water level when it rained. What will be the new water level? Graph the point on the number line. Explain how you determined your answer.

The water level would be 1.25 feet below the original lake level. If the water level was 1.25, the opposite of 1.25 is -1.25 .

- f. State a rational number that is not an integer whose value is less than 1.25, and describe its location between two consecutive integers on the number line. (vary)

ex: 0.75

It would be located between zero & 1 on the number line.

