

KEY CONCEPT OVERVIEW

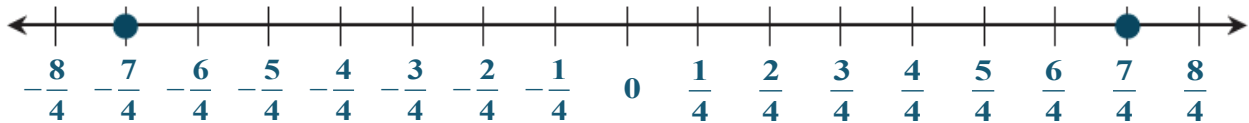
In Topic A, students are introduced to **integers** and are asked to determine where they are located on **horizontal** and **vertical number lines**. They learn about **opposites** and the **opposite of the opposite**. They also use integers to represent real-world situations and describe what the value of zero represents in various contexts. Students wrap up the topic by extending their understanding of integers as they locate **rational numbers** on the number line.

You can expect to see homework that asks your child to do the following:

- Graph a point and its opposite on the number line.
- Express various situations as integers. For example, a fee of \$2 is represented as -2 .
- Describe what zero represents in a given situation. For example, zero represents no change taking place in a bank account.
- Find the opposite of a number and its location on the number line.
- Write an equation to represent the opposite or opposite of the opposite of a number. For example, the following equation represents the opposite of negative seven: $-(-7) = 7$.

SAMPLE PROBLEM (From Lesson 6)

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 tick mark will have an equal length of $\frac{1}{4}$. The fraction $-\frac{7}{4}$ 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, $-\frac{7}{4}$, is located between -2 (or $-\frac{8}{4}$) and -1 (or $-\frac{4}{4}$).

Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

HOW YOU CAN HELP AT HOME

You can help at home in many ways. Here are some tips to help you get started.

- Have your child create a number line from -10 to 10 . It may help to use grid paper. State a fractional value (e.g., $\frac{2}{3}$ or $\frac{4}{5}$) or a decimal value (e.g., 1.5 or -7.25), and ask your child to correctly locate that value and its opposite on the number line.
- Play Integer War. Use a standard deck of cards, assigning red to represent negative values and black to represent positive values. All red face cards represent -10 , and all black face cards represent 10 . Shuffle the deck and divide the cards evenly between you and your child. Each of you flips over one card, and the person with the card showing the larger value wins that turn and collects both cards. Continue to play until one player collects all the cards and wins the game.

TERMS

Integer: A positive or negative whole number, including the number zero. The set of integers is: $\{\dots, -3, -2, -1, 0, 1, 2, 3, \dots\}$.

Negative number: A number that is less than zero.

Opposites: Numbers that are the same distance from zero on the number line but are on different sides of zero. For example, -3 and 3 are opposites.

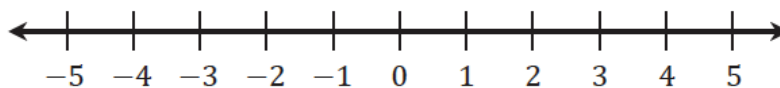
Opposite of the opposite: A number that has the same value as the original number. The opposite of the opposite of -3 is written as $-(-(-3))$, which is -3 .

Positive number: A number that is greater than zero.

Rational number: A number that can be written as a ratio or fraction involving two integers, the second of which is not zero (the denominator of a fraction cannot be zero). Rational numbers include integers (e.g., 4 because it can be written as $\frac{4}{1}$), fractions, terminating (ending) decimals, and repeating decimals.

MODELS

Horizontal Number Line



Vertical Number Line

