



# MATH NEWS



Grade 6, Module 3, Topic A

## 6<sup>th</sup> Grade Math

*Module 3: Rational Numbers*

### Math Parent Letter

This document is created to give parents and students a better understanding of the math concepts found in Eureka Math (© 2013 Common Core, Inc.) that is also posted as the Engage New York material which is taught in the classroom. In Module 3 of Eureka Math (Engage New York), students extend the number line (both horizontally and vertically) to include the opposites of whole numbers. The number line serves as a model to relate integers and other rational numbers to statements of order in real-world contexts.



### Focus Area Topic A:

*Understanding Positive and Negative Numbers on a Number Line*

#### Words to Know:

**Integers** - The numbers ..., -3, -2, -1, 0, 1, 2, 3... on the number line.

**Positive Number** - A number greater than zero.

**Negative Number** - A number less than zero.

**Opposite** - A position on the other side of zero, as in negative numbers are the opposite direction from zero on the number line as positive numbers. Positive numbers are on the opposite side of zero from the negative numbers. (5 is the opposite of -5; -3 is the opposite of 3).

**Charge** - As in a charge to an account, or a fee charged, which is the amount of money a person must pay.

**Credit** - A decrease in an expense, as in money credited to an account. For instance, when a deposit is made into a checking account, the money is credited to the account. A credit is the opposite of a debit.

**Debit** - An increase in an expense or money paid out of an account. For instance, using a debit card to make a purchase will result in an expense, and money will be deducted from the related bank account.

### Focus Area Topic A:

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#### Words to Know: (continued)

**Deposit** - The act of putting money into an account.

**Withdraw** - The act of taking money out of an account.

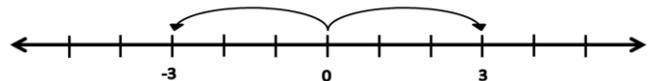
**Elevation** - The height of a person, place, or thing above a certain reference level.

**Rational Number** - A fraction or the opposite of a fraction on the number line.

Students apply their understanding of the ordering of whole numbers, positive fractions, and decimals to extend the number line in the opposite direction. Students will use positive integers to locate negative integers on the number line, moving in the opposite direction from zero, realizing that zero is its own opposite. Practice will be done on both horizontal and vertical number lines.

#### Example Problem and Solution:

Show and explain how to find 3 and the opposite of 3 on a number line.



To graph 3 on a horizontal number line, we start at zero and move to the right 3 spaces. To graph its opposite, we start at zero, but this time we move in the opposite direction (to the left) 3 spaces. The opposite of 3 is -3 because it is the same distance from 0 in the other direction.

To graph a number on a vertical number line, we follow the same procedure; the only difference is moving up the number line from 0 is positive, and moving down from 0 is negative.



## Focus Area Topic A:

### *Understanding Positive and Negative Numbers on a Number Line*



#### Understanding Positive and Negative Numbers in the Real-World

Students need to understand how negative and positive numbers can be used to represent real-world situations. One of the ways involves money. Students will be introduced to basic financial vocabulary – deposit, credit (credited), debit (debited), withdrawal, and change (gain or loss). Students will brainstorm other real-world situations in which negative (loss) and positive (gain) numbers can be represented.

#### Example Problem and Solution:

Express each situation as an integer

1. A deposit of \$2,587. **(2,587)**
2. 200 feet below sea level **(-200)**
3. A fee charge of \$5.00 **(-5)**
4. Scoring 36 points in a game **(37)**
5. Losing 27 pounds **(-27)**
6. 84 degrees above 0 **(84)**
7. A withdrawal of \$92 **(-92)**
8. A 50 yard gain in football **(50)**
9. 7,000 feet above sea level **(7,000)**
10. 35 degrees below 0 **(-35)**

Clues to determining positive and negative integers:

**Positive** – gain, above, deposit, credit

**Negative** – withdraw, loss, below, fee, debit

#### The Opposite and the Opposite of the Opposite of a Number

Students recognize that a number and its opposite will be on opposite sides of zero and that both lie the same distance from zero. Students represent the opposite of a positive number as a negative number and vice-versa. Students realize that zero is its own opposite and that the opposite of the opposite of a number is actually the number itself.

#### Example Problem and Solution:

Write the integer that represents the opposite of each situation. Explain what zero means in each situation.

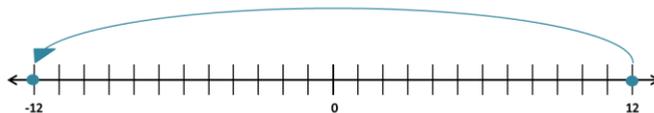
1. 300 feet above sea level  
**-300; zero represents sea level**
2. 75 degrees below zero  
**75; zero represents 0 degrees**
3. A credit of \$40  
**-40; zero represents no change in the account**

## Focus Area Topic A:

### *Understanding Positive and Negative Numbers on a Number Line*

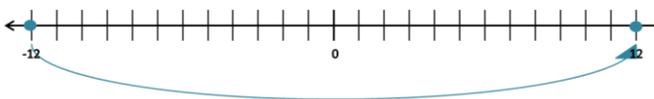
#### Example Problem and Solution:

What is the **opposite** of 12? How can we illustrate this number on a number line?



The opposite of 12 is -12. They are equal distance and on opposite side of zero from each other.

What is the **opposite of the opposite** of 12? Demonstrate this on a number line.



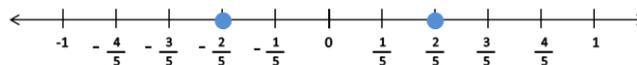
Since the opposite of 12 is -12, the opposite of -12 is 12. This means that the opposite of the opposite of 12 is 12. Students will learn that the opposite of the opposite is the number itself.

#### The Rational Numbers and their Opposites

Students realize that finding the opposite of any rational number is the same as finding an integer's opposite.

#### Example Problem and Solution:

Graph  $\frac{2}{5}$  and its opposite.



Since we are working with a fraction, it is best to set up our number line using fractional pieces. The line should be scaled by  $\frac{1}{5}$ . We find that  $\frac{2}{5}$  and  $-\frac{2}{5}$  are an equal distance from zero and on opposite sides of zero on the number line.

Rational numbers and their opposites are found the exact same way as integers are found.

