



# MATH NEWS



LAFAYETTE  
PARISH SCHOOL SYSTEM

Grade 7, Module 2, Topic A

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

*Module 2: 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. Module 2 of Eureka Math (Engage New York) builds on their understanding of rational numbers to add, subtract, multiply, and divide signed numbers. Previous work in computing the sums, differences, products, and quotients of fractions serves as a significant foundation as well.



### Focus Area Topic A:

*Addition and Subtraction of Integers and Rational Numbers*

#### Words to Know:

**Additive Inverse-** The additive inverse of a real number is the opposite of that number on the real number line. For example, the opposite of -3 is 3. A number and its additive inverse have a sum of 0.

**Distance Formula-** If  $p$  and  $q$  are rational numbers on a number line, then the distance between  $p$  and  $q$  is the absolute value of the positive difference between  $p$  and  $q$  or  $|p - q|$ .

**Loss-** a decrease in amount; as when the money earned is less than the money spent.



The cards -2, -4, and 1 total -5.

Explanation:  $-2 + -4 + 1 = -5$

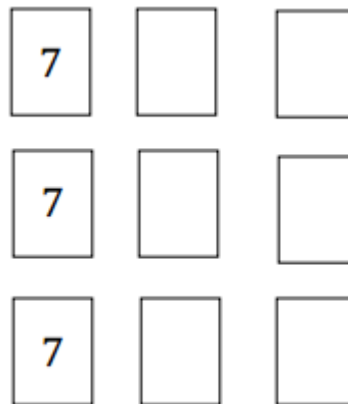
### Focus Area Topic A:

*Addition and Subtraction of Integers and Rational Numbers*

Students return to the number line to model the addition and subtraction of integers. They use the number line and the Integer Game to demonstrate that an integer added to its opposite equals zero, representing the additive inverse. Their findings are formalized as students develop rules for adding and subtracting integers, and they recognize that subtracting a number is the same as adding its' opposite.

### Example Problem and Answer

Your hand starts with the 7 cards. Find three different pairs that would complete your hand and result in a value of zero.



**Answer:** Answers will vary. (-3 and -4)

(-5 and -2)

(-10 and 3)

Explanation:  $7 + -3 + -4 = 0$

$7 + -5 + -2 = 0$

$7 + -10 + 3 = 0$



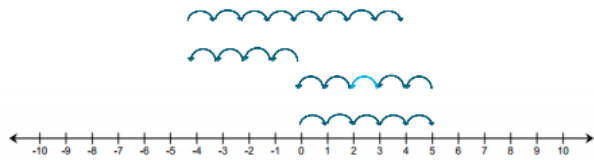
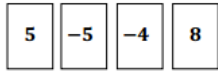
## Focus Area Topic A:



Students add positive integers by counting up for positive integers and counting down for negative integers.

### Example Problem and Solution

What is the value of the sum of the card values shown?

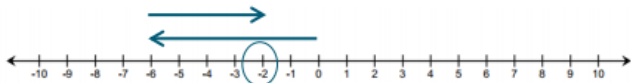


**Answer:** 4. Explanation:  $5 + -5 + -4 + 8 = 4$  (Move to the right when adding positive integers and move to the left when adding negative integers)

Students model integer addition on the number line by using horizontal arrows; e.g. an arrow for -2 is a horizontal arrow of length 2 pointing in the negative direction.

### Example Problem and Solution

Create a number line model to represent the expression  $-6 + 4$

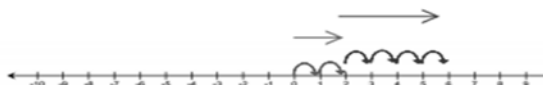
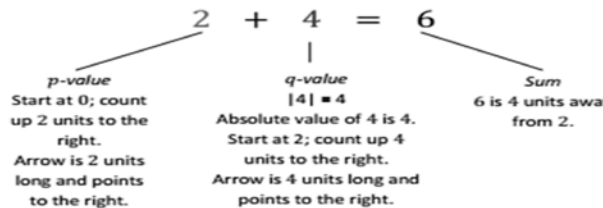


**Answer:** -2. Explanation: Start at 0, move 6 places to the left when adding -6, then from there move 4 places to the right to add 4. You land on -2.

Students use arrows to show the sum of two integers,  $p + q$ , on a number line and to show that the sum is the positive distance from  $p$  to the right if  $q$  is positive and to the left if  $q$  is negative.

### Example Problem and Solution

#### Horizontal Number Line Model of Counting Up



Students add integers with opposite signs by subtracting the smaller absolute value from the larger absolute value and using the sign of the number with the larger absolute value.

### Example Problem and Solution

Find the sum of  $-18 + 7$

$$\begin{aligned} |-18| &= 18 \\ |7| &= 7 \\ 18 - 7 &= 11 \\ -11 \end{aligned}$$

Explanation: The absolute value is the number's distance from zero. Negative eighteen has an absolute value of 18. Seven has an absolute value of 7. Subtract  $18 - 7$ . Since -18 has the greater absolute value, the answer will take the same sign as -18. The answer is -11.

Students justify the rule for subtraction: Subtracting a number is the same as adding its' opposite.

### Example Problem and Solution

$$4 - 9$$

$$4 + -9 = -5$$

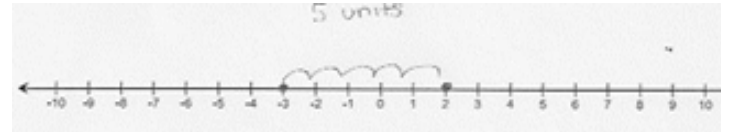
Students justify the distance formula for rational numbers on a number line.

### Example Problem and Solution

Find the distance between -3 and 2.

The steps are:

1. Start on -3.
2. Count the number of units from -3 to 2.



Using a formula:

$$|-3 - 2| = |-3 + -2| = |-5| = 5 \text{ or } |2 - (-3)| = |2 + 3| = |5| = 5$$

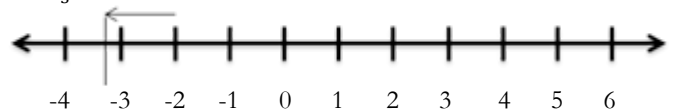


Students recognize that the rules for adding and subtracting integers apply to rational numbers.

### Example Problem and Solution

At the beginning of the summer, the water level of a pond is two feet below its normal level. After an unusually dry summer, the water level of the pond dropped another  $1\frac{1}{3}$  feet. Use a number line diagram to model the pond's current water level in relation to its normal water level.

(Move  $1\frac{1}{3}$  units to the left of -2)



$$\text{Solution: } -3\frac{1}{3}$$