Section 1.3: THE REAL NUMBERS

When you are done with your homework you should be able to…

- Define the sets that make up the real numbers
- Graph numbers on a number line
- Express rational numbers as decimals
- Classify numbers as belonging to one or more sets of the real numbers
- Understand and use inequality symbols
- Find the absolute value of a real number

WARM-UP:

Perform the indicated operation and simplify:

1. $\frac{10}{27} \cdot \frac{3}{2}$

2. $\frac{28}{9} + \frac{2}{3}$

NATURAL NUMBERS AND WHOLE NUMBERS

A _____ is a _____ of objects whose contents can be clearly determined. The objects in a set are called the _____ of the set.

Natural numbers: The _____ of _____ numbers is

Whole numbers: The _____ of _____ numbers is

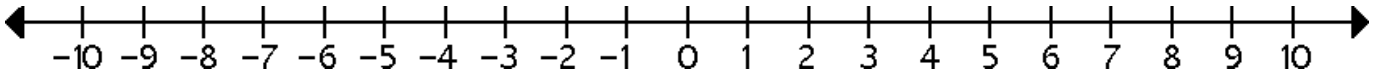
INTEGERS AND THE NUMBER LINE

The _____ consisting of the _____ numbers, _____, and the _____ of the _____ numbers is called the set of _____.

Integers: The _____ of _____ is

Example 1: Consider the following integers: 3, -3, 5, -5, 0

Graph each integer in the list on the same number line.



RATIONAL NUMBERS

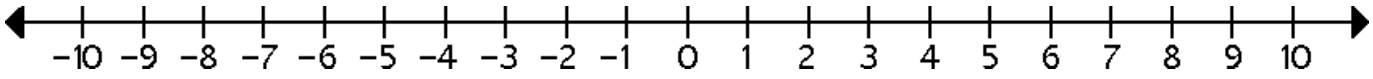
If two _____ are added, subtracted, or multiplied, the result is always another _____. Is this true when one integer is divided by another?

The set of _____ numbers is the set of all numbers that can be expressed in the form _____, where _____ and _____ are _____ and _____ is _____ equal to _____ (_____). The integer _____ is called the _____ and the integer _____ is called the _____.

Are all integers rational numbers?

Example 2: Consider the following rational numbers: $-\frac{1}{2}$, $\frac{9}{4}$, -8, $-6\frac{2}{3}$

Graph each integer in the list on the same number line.



Example 3: Divide

1. $3 \div 8$
2. $3 \div 11$

RATIONAL NUMBERS AND DECIMALS

Any _____ number can be expressed as a _____. The resulting decimal will either _____ (_____), or it will have a digit or block of digits that _____.

IRRATIONAL NUMBERS

Any number that can be represented on the _____ line that is _____ a _____ number is called an _____ number. In other words, the set of irrational numbers is the set of numbers whose _____ representations are neither _____ nor _____.

THE SET OF REAL NUMBERS

All numbers that can be represented by _____ on the number line are called _____ numbers.

THE SETS THAT MAKE UP THE REAL NUMBERS

NAME	DESCRIPTION	EXAMPLES
NATURAL NUMBERS		
WHOLE NUMBERS		
INTEGERS		

RATIONAL NUMBERS		
IRRATIONAL NUMBERS		

Example 4: Consider the following set of numbers: $\left\{-\frac{4}{2}, 8, \frac{1}{3}, \sqrt{100}, 0, \pi, 0.3\right\}$

List the numbers in the set that are

1. Natural numbers
2. Whole numbers
3. Integers

4. Rational numbers
5. Irrational numbers
6. Real numbers

INEQUALITY SYMBOLS

On the real number line, the _____ numbers _____ from _____ to _____. The _____ or two real numbers is the one farther to the _____ on a number line. The _____ of two real numbers is the one farther to the _____ on a number line.

NOTATION

Example 5: Insert < or > between each pair of integers to make the statement true.

1. 3 ____ 5
2. 3 ____ 0
3. -3____-5
4. -3____ 0
5. 0 ____-3
6. -5____ 5

ABSOLUTE VALUE

The _____ _____ of a real number ____, denoted _____, is the _____ from ____ to ____ on a number line. Is the output of an absolute value expression ever negative?

Example 6: Find the absolute value:

1. $|2.5|$

2. $|-8|$

APPLICATIONS

The table below shows the amount spent on iPAD apps by Shannon's family during the months of May and July of 2011.

Name	Amount
Shannon	$48
Morgan	$67
Rory	$25
Erin	$32
Nicole	$12

1. Graph the five dollar amounts on a number line.

2. Write the names in order from the least spent on apps to the most spent on apps