September 7, 2017

**Aim:** SWBAT distinguish between the various sets of Real Numbers AND find absolute values and opposites.

**Do Now:** 1) Fill in the Cover Page of your Unit 1 Packet  
2) Copy the notes on Page 1

**Homework:** 1) Pages 4 & 5 in the Unit 1 Packet  
2) Get class materials & prepare notebook/ folder  
   *(DUE MONDAY)*

Unit 1 Quiz is Friday (9/15)  
on Pages 1 - 20 in the Unit 1 Packet
Math 7A

Unit 1
Numbers and Operations

A
Pre-Algebra
“Starter Kit”

Name: _____________________________
Teacher: Mrs. LaRocco  Period: ___
Unit 1 - Basic Skills
In this unit we will review and extend our understanding of our number system. We will begin by reviewing all types of numbers and properties. We will review operations with whole numbers, fractions and decimals. We will extend our understanding of operations numbers to include operations with negative integers as well as negative fractions and decimals. We will use these operations to simplify and evaluate algebraic expressions.

Topics Included:

Real Number System
- Opposites
- Absolute Value
- Properties of Addition and Multiplication
- Positive and Negative Integer Operations (Addition, Subtraction, Multiplication, Division)
- Using the correct “Order of Operations” (PEMDAS)

Rational Numbers (Positive and Negative Fractions/Decimals)
- Comparing and Ordering Fractions and Decimals
- Converting between fractions and mixed numerals
- Operations with fractions and mixed numerals
- Decimal Place Value
- Rounding Decimals
- Converting between fractions and decimals
- Converting between decimals and percents.
- Decimal operations

Algebraic Expressions
- Simplifying Expressions
- Using the correct “Order of Operations” (PEMDAS) to evaluate algebraic expressions with all types of Rational Numbers (Integers, Positive/Negative Fractions and Decimals)
AIM: SWBAT distinguish between the sets of Real Numbers, find absolute values & opposites.

Real Numbers

Rational Numbers

Irrational Numbers

Integers

Whole Numbers

Counting/Natural Numbers
AIM: SWBAT distinguish between the sets of Real Numbers, find absolute values & opposites.

Real Numbers

All the rational #'s AND all the irrational #'s

Rational Numbers
Any number that CAN be written as a fraction
All natural #'s, whole #'s, integers, and terminating and repeating decimals

Irrational Numbers
Any number that CANNOT be written as a fraction
All NON-terminating AND NON-repeating decimals
π (pi) is also irrational

Integers
All the whole #'s AND their opposites
... -3, -2, -1, 0, 1, 2, 3 ...

Whole Numbers
All the counting #'s AND Zero
0, 1, 2, 3, ...

Counting/Natural Numbers

1, 2, 3, ...
Place each number in ALL the sets it belongs to.

-7  0.25  12  0  \( \frac{1}{2} \)  \( \pi \)  -\( \frac{3}{4} \)  -4.5273...

<table>
<thead>
<tr>
<th>Rational Numbers</th>
<th>Irrational Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>-7   0.25  12  0  ( \frac{1}{2} )  ( \pi )  -( \frac{3}{4} )</td>
<td>-4.5273...  ( \pi )</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Integers</th>
<th>Whole Numbers</th>
<th>Natural Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>-7  12  0</td>
<td>12  0</td>
<td>12</td>
</tr>
</tbody>
</table>

Answer each question with...

1) Whole Numbers are Integers.  \( \text{ALWAYS} \)  \( \text{SOMETIMES} \)  \( \text{NEVER} \)
   \( A \)  \( S \)  \( N \)

2) Real Numbers are Irrational  \( \text{ALWAYS} \)  \( \text{SOMETIMES} \)  \( \text{NEVER} \)
   \( A \)  \( S \)  \( N \)

3) Rational Numbers are Irrational  \( \text{ALWAYS} \)  \( \text{SOMETIMES} \)  \( \text{NEVER} \)
   \( A \)  \( S \)  \( N \)

4) Integers are Natural Numbers  \( \text{ALWAYS} \)  \( \text{SOMETIMES} \)  \( \text{NEVER} \)
   \( A \)  \( S \)  \( N \)

5) Whole Numbers are Real Numbers  \( \text{ALWAYS} \)  \( \text{SOMETIMES} \)  \( \text{NEVER} \)
   \( A \)  \( S \)  \( N \)
**Day 01 - The Real # System, Opposites, Abs. Value**

Place each number in all the sets it belongs to.

-7  0.25  12  0  \(\frac{1}{2}\)  \(\pi\)  \(-\frac{3}{4}\)  -4.5273...

**Real Numbers**

{\[-7\quad \pi\quad 12\quad 0\quad \frac{1}{2}\quad \frac{3}{4}\quad 0.25\quad \frac{3}{4}\quad \pi\quad -4.5273\ldots\]}

**Rational Numbers**

-7 \(\frac{1}{2}\)  0  \(\frac{3}{4}\)  0.25  12  \(\frac{3}{4}\)

**Integers**

-7  12  0

**Whole Numbers**

12  0

**Counting/Natural Numbers**

12

**Irrational Numbers**

\(\pi\)  -4.5273...

Answer each question with...

<table>
<thead>
<tr>
<th>1) Whole Numbers are Integers.</th>
<th>ALWAYS</th>
<th>SOMETIMES</th>
<th>NEVER</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>S</td>
<td>N</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2) Real Numbers are Irrational</th>
<th>ALWAYS</th>
<th>SOMETIMES</th>
<th>NEVER</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>S</td>
<td>N</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3) Rational Numbers are Irrational</th>
<th>ALWAYS</th>
<th>SOMETIMES</th>
<th>NEVER</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>S</td>
<td>N</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4) Integers are Natural Numbers</th>
<th>ALWAYS</th>
<th>SOMETIMES</th>
<th>NEVER</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>S</td>
<td>N</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5) Whole Numbers are Real Numbers</th>
<th>ALWAYS</th>
<th>SOMETIMES</th>
<th>NEVER</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>S</td>
<td>N</td>
<td></td>
</tr>
</tbody>
</table>
Notes:

**Opposite numbers** are the same distance from zero on a number line in opposite directions. For example 5 and -5 are opposites. They are both 5 spaces away from zero.

ZERO is a special integer because it is neither positive nor negative.

Why is zero an integer? 

Comparing Integers: 

> Greater than  < Less than

Examples: 36 > 12 is read “36 is greater than 12”
15 < 29 is read “15 is less than 29”

The number farther right on the number line is the larger number.

Ex. 15 ___ 25 92 ___ 63 0 ___ 12
-5 ___ 0 -5 ___ -18 -12 ___ 12

Ordering Integers: Order from least to greatest.

-5, -9, 0, -3 ___ ___ ___ ___ ___
-2, 7, -5, -1 ___ ___ ___ ___ ___

**The three questions most often missed.**

1. Name a number that is not an integer? ______
2. Name the largest negative integer. ______
3. Name the smallest positive integer. ______

Absolute Value measures the _______ a number is from zero on the number line. Distance is always POSITIVE, therefore, Absolute Value is ALWAYS ______.

The symbol for absolute value is “| |.”

|4| “What is the absolute value of 4?” |4| = ______
|-4| “What is the absolute value of -4?” |-4| = ______

True or False -4 = 4 ______ 4 = 4 ______ |-4| = |4| ______

The negative symbol “-” means **opposite**. For example the “opposite of 4” is -4.

Simplify the expression. (Start from the inside and work it out)

1) -(-4) ______ 2) -(-(-4)) ______ 3) -[(-(-4))] ______ 4) -(-(-(-4))) ______
5) -|-4| ______ 6) -( - |-4|) ______ 7) - - - |-4| ______
Notes:
**Opposite numbers** are the same distance from zero on a number line in opposite directions. For example 5 and -5 are opposites. They are both 5 spaces away from zero.

Zero is a special integer because it is neither positive nor negative. because it is a whole number and integers are the whole numbers and their opposites

**Comparing Integers:**

> greater than  
< less than

Examples:

- 36 > 12 is read "36 is greater than 12"
- 15 < 29 is read "15 is less than 29"

The number farther right on the number line is the larger number.

Ex. 15 < 25  
92 > 63  
0 < 12
-5 < 0  
-5 > -18  
-12 < 12

**Ordering Integers:** Order from least to greatest.

-5, -9, 0, -3, -9, -5, -3, 0, -2, 7, -5, -1, -5, -2, -1, 7

The three questions most often missed.

1. Name a number that is not an integer? 0.25 (any fraction or decimal)
2. Name the largest negative integer. ____________
3. Name the smallest positive integer. ____________

Absolute Value measures the **distance** a number is from zero on the number line. Distance is always POSITIVE, therefore, Absolute Value is ALWAYS positive.

The symbol for absolute value is "| |."  
|4| "What is the absolute value of 4?" |4| = ____________  
|-4| "What is the absolute value of -4?" |-4| = ____________

**True or False**

-4 = 4 ________  
|4| = |4| ________  
4 = 4 ________

The negative symbol "-" means opposite. For example the "opposite of 4" is -4. Simplify the expression. (Start from the inside and work it out)

1) -(-4) ________  
2) -(-(-4)) ________
3) -[-(-(-4))] ________  
4) -(-(-(-4))) ________

5) -[-4] ________  
6) -(- | -4|) ________  
7) - - | -4| ________

* Page #3
**HOMEWORK - SETS OF NUMBERS**

**Use the chart we made in class to help you answer these questions!**

<table>
<thead>
<tr>
<th>Answer the following with....</th>
<th>SOMETIMES</th>
<th>ALWAYS</th>
<th>NEVER</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Counting Numbers are Whole Numbers.</td>
<td>S</td>
<td>A</td>
<td>N</td>
</tr>
<tr>
<td>2) Whole Numbers are Real Numbers.</td>
<td>S</td>
<td>A</td>
<td>N</td>
</tr>
<tr>
<td>3) Counting Numbers are Integers.</td>
<td>S</td>
<td>A</td>
<td>N</td>
</tr>
<tr>
<td>4) Integers are Counting Numbers.</td>
<td>S</td>
<td>A</td>
<td>N</td>
</tr>
<tr>
<td>5) Counting Numbers are Rational..</td>
<td>S</td>
<td>A</td>
<td>N</td>
</tr>
<tr>
<td>6) Real Numbers are Irrational.</td>
<td>S</td>
<td>A</td>
<td>N</td>
</tr>
<tr>
<td>7) Integers are Rational Numbers.</td>
<td>S</td>
<td>A</td>
<td>N</td>
</tr>
<tr>
<td>8) Rational Numbers are Whole Numbers.</td>
<td>S</td>
<td>A</td>
<td>N</td>
</tr>
<tr>
<td>9) Whole Numbers are Rational.</td>
<td>S</td>
<td>A</td>
<td>N</td>
</tr>
<tr>
<td>10) Rational Numbers are Irrational.</td>
<td>S</td>
<td>A</td>
<td>N</td>
</tr>
</tbody>
</table>

State ALL of the sets of numbers that each of the following belongs to:

<table>
<thead>
<tr>
<th>Real</th>
<th>Irrational</th>
<th>Rational</th>
<th>Integer</th>
<th>Whole</th>
<th>Natural</th>
</tr>
</thead>
<tbody>
<tr>
<td>11) 0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12) -5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13) 3.421123...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14) 2.56</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15) 20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16) -3/5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17) 0.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Write the OPPOSITE and then ABSOLUTE VALUE of each integer:

18) 7  _____  _____  19) -25  _____  _____
20) 106  _____  _____  21) 0  _____  _____

Complete the Statement with < or >.

22) -6  _____  4  23) -2  _____  -4  24) 0  _____  8

Match the integer expression with the verbal expression:

25)  _____  -|12|  A. the opposite of negative twelve
26)  _____  |-12|  B. the absolute value of twelve
27)  _____  -|-12|  C. the opposite of the absolute value of negative twelve
28)  _____  -(-12)  D. the absolute value of negative twelve
29)  _____  |12|  E. the opposite of the absolute value of twelve

Simplify the expression:

30)  _____  -(-9)  31)  _____  |-16|  32)  _____  -|-16|

The table below shows the distances of the runners from the finish line when the winner won the race. Use the table to answer Questions 33 - 35.

<table>
<thead>
<tr>
<th>Runner</th>
<th>Distance (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sarah</td>
<td>-16</td>
</tr>
<tr>
<td>Beth</td>
<td>-2</td>
</tr>
<tr>
<td>Juanita</td>
<td>0</td>
</tr>
<tr>
<td>Tamika</td>
<td>-9</td>
</tr>
<tr>
<td>Ingrid</td>
<td>-36</td>
</tr>
</tbody>
</table>

33) Who won the race? ______________________

34) Who finished further back, Sarah or Tamika? ______________________

35) Arrange the girls’ names in order from first-place to last-place finish.
    (Hint: use a number line to help you)

<table>
<thead>
<tr>
<th>1st Place</th>
<th>2nd Place</th>
<th>3rd Place</th>
<th>4th Place</th>
<th>5th Place</th>
</tr>
</thead>
</table>

HW - Page #5
**HOMEWORK - SETS OF NUMBERS**

**Use the chart we made in class to help you answer these questions!**

Answer the following with....

<table>
<thead>
<tr>
<th></th>
<th>SOMETIMES</th>
<th>ALWAYS</th>
<th>NEVER</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Counting Numbers are Whole Numbers.</td>
<td>S</td>
<td>A</td>
<td>N</td>
</tr>
<tr>
<td>2) Whole Numbers are Real Numbers.</td>
<td>S</td>
<td>A</td>
<td>N</td>
</tr>
<tr>
<td>3) Counting Numbers are Integers.</td>
<td>S</td>
<td>A</td>
<td>N</td>
</tr>
<tr>
<td>4) Integers are Counting Numbers.</td>
<td>S</td>
<td>A</td>
<td>N</td>
</tr>
<tr>
<td>5) Counting Numbers are Rational.</td>
<td>S</td>
<td>A</td>
<td>N</td>
</tr>
<tr>
<td>6) Real Numbers are Irrational.</td>
<td>S</td>
<td>A</td>
<td>N</td>
</tr>
<tr>
<td>7) Integers are Rational Numbers.</td>
<td>S</td>
<td>A</td>
<td>N</td>
</tr>
<tr>
<td>8) Rational Numbers are Whole Numbers.</td>
<td>S</td>
<td>A</td>
<td>N</td>
</tr>
<tr>
<td>9) Whole Numbers are Rational.</td>
<td>S</td>
<td>A</td>
<td>N</td>
</tr>
<tr>
<td>10) Rational Numbers are Irrational.</td>
<td>S</td>
<td>A</td>
<td>N</td>
</tr>
</tbody>
</table>

State **ALL** of the sets of numbers that each of the following belongs to:

- **Real**
- Irrational **OR** Rational
- Integer
- Whole
- Natural

11) 0 **whole, integer, rational, real**
12) -5 **integer, rational, real**
13) 3.421123... **irrational, real**
14) 2.56 **rational, real**
15) 20 **natural, whole, integer, rational, real**
16) $\frac{3}{5}$ **rational, real**
17) 0.6 **rational, real**
Write the **OPPOSITE** and then **ABSOLUTE VALUE** of each integer:

18) 7    **-7**  
19) -25    **25**  
20) 106    **-106**    **106**  
21) 0    **0**  

Complete the Statement with < or >.

22) -6    **<**    4  
23) -2    **>**    -4  
24) 0    **<**    8

Match the integer expression with the verbal expression:

E 25) -|-12|  
A. the opposite of negative twelve  
D 26) |-12|  
B. the absolute value of twelve  
C 27) -|-12|  
C. the opposite of the absolute value of negative twelve  
A 28) -(-12)  
D. the absolute value of negative twelve  
B 29) |12|  
E. the opposite of the absolute value of twelve

Simplify the expression:

30) -(-9) = 9  
31) |-16| = 16  
32) -|-16| = -16

The table below shows the distances of the runners from the finish line when the winner won the race. Use the table to answer Questions 33 - 35.

<table>
<thead>
<tr>
<th>Runner</th>
<th>Distance (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sarah</td>
<td>-16</td>
</tr>
<tr>
<td>Beth</td>
<td>-2</td>
</tr>
<tr>
<td>Juanita</td>
<td>0</td>
</tr>
<tr>
<td>Tamika</td>
<td>-9</td>
</tr>
<tr>
<td>Ingrid</td>
<td>-36</td>
</tr>
</tbody>
</table>

33) Who won the race? **Juanita**
34) Who finished further back, Sarah or Tamika? **Sarah**
35) Arrange the girls’ names in order from first-place to last-place finish.

(Hint: use a number line to help you)

1st Place  Juanita  2nd Place  Beth  3rd Place  Tamika  4th Place  Sarah  5th Place  Ingrid

Ingrid  Sarah  Tamika  Beth  Juanita

-36  -16  -9  -2  0

Finish Line

* HW - Page #5