

# Unit 1: ADDING & SUBTRACTING RATIONAL NUMBERS

I can solve problems involving integers and absolute value.

**Integers Definition:** set of positive whole numbers, their opposites, and zero

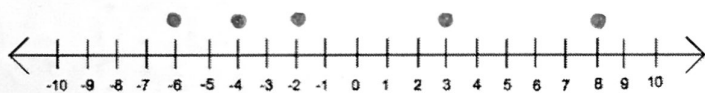
So this includes the set of numbers: (...-3, -2, -1, 0, 1, 2, 3...)

Real Life Example: 10° below zero is -10

## Examples:

1) Put the following integers in order from **least to greatest** by plotting them on the # line:

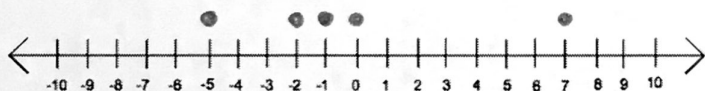
The numbers: -4, 8, -2, -6, 3



Answer: -6, -4, -2, 3, 8

2) Put the following integers in order from **greatest to least** by plotting them on the # line:

The numbers: -2, 0, 7, -1, -5



Answer: 7, 0, -1, -2, -5

## Comparing Integers

Write down the numbers from the board and fill in the blank with greater than (>) or less than (<).

1. -10 < 4

2. 3 > -9

3. -15 > -20

4. -1 < 0

5. -2 > -4

6. 7 > -9

## Test Examples:

<p>Four numbers are marked with an X on this number line.</p> <p>Which marked number is the least?</p> <p>A. -20 B. -10 C. 5 D. 15</p>	<p>Each mark on the number line represents one unit. Plot a point on the number line that represents the opposite of -5 units.</p> <p>Select a place on the number line to plot the point.</p> <p style="text-align: center;">Low Temperatures of Four Cities One Night</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>City</th> <th>Temperature</th> </tr> </thead> <tbody> <tr> <td>Boston</td> <td>3°F</td> </tr> <tr> <td>Lowell</td> <td>0°F</td> </tr> <tr> <td>Springfield</td> <td>-8°F</td> </tr> <tr> <td>Worcester</td> <td>-5°F</td> </tr> </tbody> </table> <p>Which city had the lowest temperature that night?</p>	City	Temperature	Boston	3°F	Lowell	0°F	Springfield	-8°F	Worcester	-5°F
City	Temperature										
Boston	3°F										
Lowell	0°F										
Springfield	-8°F										
Worcester	-5°F										

**Absolute Value:** the distance of a number to zero

Example:  $|6| = 6$      $|-6| = 6$

Absolute value is always positive !

$$|-9| = 9$$

$$|10| = 10$$

$$|-3| = 3$$

$$|6| = 6$$

$$-|-9| = -9$$

$$-|10| = -10$$

$$-|-3| = -3$$

$$-|6| = -6$$

**Comparing Absolute Values:** Find the absolute value first. THEN compare.

1) Compare the numbers  $|-9| > |5|$        $9 > 5$

2) Compare the numbers  $|18| < |-19|$        $18 < 19$

3) Compare the numbers  $|-3| = |3|$        $3 = 3$

**Absolute Values: Evaluating Expressions**

1)  $|18| \div 2 \times |-3| = \underline{27}$   
 $18 \div 2 \times 3$   
 $9 \times 3$

2)  $|-3| + 10 = \underline{13}$   
 $3 + 10$

3)  $(12 + |-8|) \div |-5| = \underline{4}$   
 $(12 + 8) \div 5$   
 $20 \div 5$

4)  $|-16| - |-16| = \underline{0}$   
 $16 - 16$

**Ordering Integers with Absolute Value**

$-2, |-3|, 0, |-4|, -5$   
 $-2, 3, 0, -4, -5$

$-5, |-4|, -2, 0, |-3|$

$|-7|, -3, |-3|, -9, -1$

$7, -3, 3, -9, -1$

$-9, -3, -1, |-3|, |-7|$

**Test Examples:**

What is the value of the expression below?

$$|3| + |-3| + |-1|$$

A. -7

B. -1

C. 1

D. 7

$$3 + 3 + 1$$

Simplify the expression.  $-2 + |-5|$

A. -7

B. -3

C. 3

D. 7

$$-2 + 5$$