1.4: Comparing and Ordering Real Numbers

KNOWLEDGE:
- ✓ Numbers can be classified by their characteristics. Some types of numbers can be represented on the number line.

SKILLS:
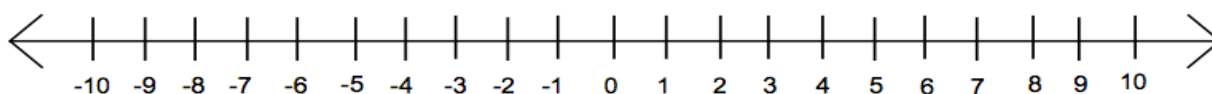- ✓ Manipulate real numbers to compare or order them from least to greatest.

VOCABULARY:
- ✓ Real numbers, integers

The Real Number Line

- ✓ **Real numbers** are
- ✓ In the real number line the scale marks are equally spaced and usually represent integers.

- • **Integers** are

- ✓ The real number line has points that represent fractions and decimals as well as integers.
- ✓ Drawing the point is called **graphing** or **plotting** the number.
- ✓ To plot a real number:
    - Draw and label a number line
    - Find where the number is on the number line and place a dot on the number

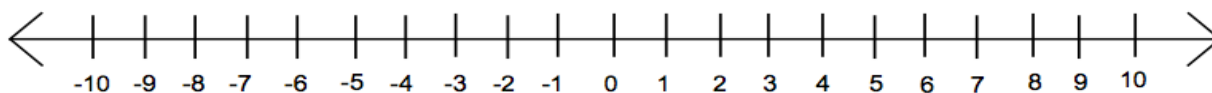### Example 1: Plotting Real Numbers on the Number Line
Directions: Graph the numbers ½ and -2.3 on a number line.

     ***Once points have been plotted on the number line you can *compare* the numbers.

Example 2: Comparing Real Numbers
Directions: Graph – 4 and – 5 on a number line. Then write 2 inequalities that compare the numbers.

Example 3: Comparing Real Numbers
Directions: Replace the blank with <, >, or = to make a true sentence.

    A) $\frac{4}{7}$_____$0.\overline{5}$
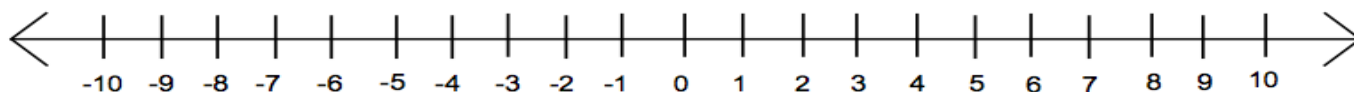   B) $\frac{1}{8}$_____$\frac{1}{\sqrt{18}}$

Ordering Real Numbers

- ✓ Often times you will be asked to order numbers from least to greatest or greatest to least.
- ✓ You can use the number line to help you by plotting the numbers and then reordering them...
- ✓ A strategy you can use here is to convert the numbers to decimals and then plot and/or order them as requested

Example 4: Ordering Real Numbers on a Number Line
Directions: Write the numbers in increasing order: - 2, 4 , 0, 1.5, ½ , - 3/2

$$\leftarrow \quad -10 \quad -9 \quad -8 \quad -7 \quad -6 \quad -5 \quad -4 \quad -3 \quad -2 \quad -1 \quad 0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad 7 \quad 8 \quad 9 \quad 10 \quad \rightarrow$$

- In the previous example we converted 2 fractions into decimals to make it easier to plot on the number line...
- When writing your final solution to the problem you should always use the original numbers. In this case it was ½ and – 3/2 which are displayed in the solution

Example 5: Ordering Real Numbers in a List
Directions: Write the numbers in order from least to greatest.

$$-2.\overline{54},\ -\sqrt{6},\ -2\frac{1}{4},\ \frac{22}{-9}$$