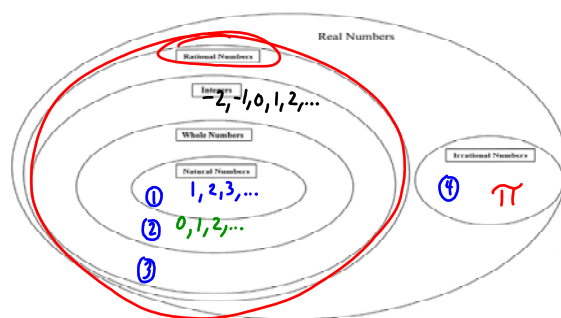


Do Now: Write the following groupings of numbers where you think they belong below.



Name \_\_\_\_\_  
Date \_\_\_\_\_

Algebra 1 CC  
Number Systems

Definitions to remember:

$$\begin{array}{r} 237 \\ \hline 9464 \end{array}$$

**Natural numbers** - 1, 2, 3, ...

$$\frac{2}{3} \quad 2:3$$

**Whole numbers** - 0, 1, 2, 3, ... Natural numbers and zero.

**Integers** - ..., -3, -2, -1, 0, 1, 2, 3 ... Whole numbers and their opposites

**Rational numbers** are numbers that can be written as the ratio of two integers, expressed as a fraction. For example: -7 can be written as  $-\frac{7}{1}$ ,  $2\frac{2}{3}$  can be written as  $\frac{8}{3}$ , and 9% which can be written as  $\frac{9}{100}$ . These are all examples of rational numbers.

Give three more examples of a rational number.  $\frac{3}{3} = 1$   $\frac{4}{1} = 4$   $\frac{5}{7}$  4.6

Any fraction can be expressed as a decimal by dividing the numerator by the denominator. The result will either be terminating decimal which ENDS, or a repeating decimal which has a pattern in its digits that repeats WITHOUT end.

Write each fraction or mixed number as a decimal. **State if the decimal is terminating or repeating.**

4) $\frac{5}{8} = .625$ terminating	5) $-1\frac{1}{3}$ repeating $-1.\bar{3}$	6) $\frac{3}{4} = 0.75$ terminating
--	--	--

Write each decimal as a fraction in simplest form.

7) 0.4 $\frac{4}{10} = \frac{2}{5}$	8) 0.45 $\frac{45}{100} = \frac{9}{20} \checkmark$	9) -0.9 $-\frac{9}{10}$
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**Irrational numbers** are infinite and non-repeating decimals. For example,  $\sqrt{3}$  is an irrational number.

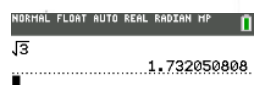
Give three more examples of an irrational number. \_\_\_\_\_

$\sqrt{1} = 1$   
 $\sqrt{\frac{2}{3}}$   
 $\sqrt{4} = 2$   
 $\sqrt{5}$   
 $\sqrt{9} = 3$   
 $\sqrt{6} = 4$

Tell whether each number is rational or irrational.

- 10) 0.44 rational      11)  $\frac{2}{3}$  .6666666  
 12)  $\sqrt{9} = 3$  rational      13)  $\sqrt{10}$  \_\_\_\_\_

*rational*



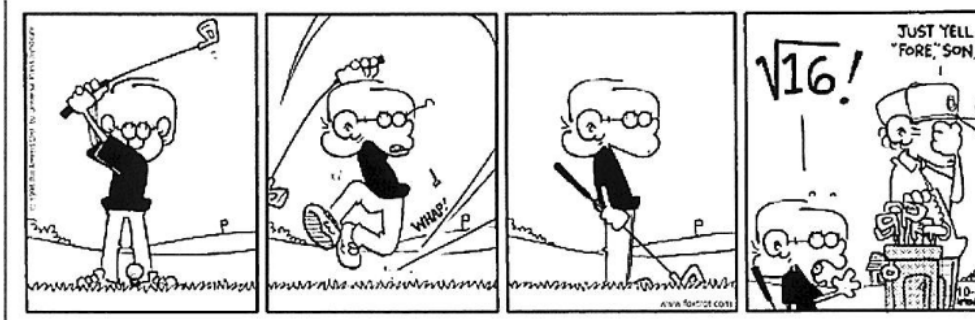
$\sqrt{3}$

Review and remember.... SIMPLIFY:

14) $-2 + -3 =$	15) $-2 - (-3) =$	16) $-2(-3) =$	17) $-2(3) =$
18) $-12 \div -6 =$	19) $2 - 13 + 8 =$	20) $5(-3) - 20 =$	21) $19 - 3 \times 6 =$
22) $(0.3)^2$	23) $4^2 - 5^2$	24) $(2 - 3)^3$	25) $-4(9 - 6)^2$

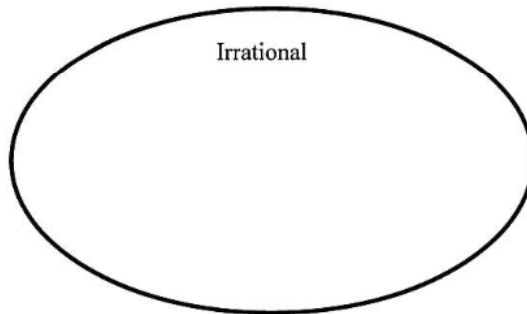
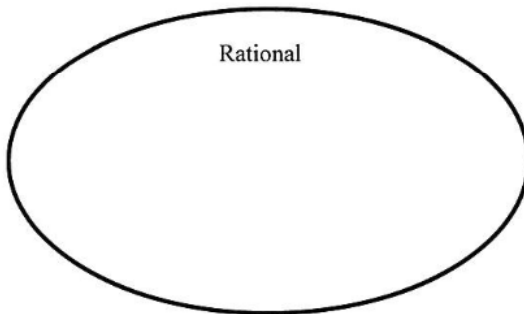
Name: \_\_\_\_\_

**Rational vs. Irrational HW**



1. Sort the numbers into 2 groups, rational or irrational. Write the numbers in the appropriate bubble.

- 0.8       $\sqrt{64}$       0       $\sqrt{32}$       -19       $-\sqrt{100}$       2.343443444...
- $\frac{3}{7}$        $\sqrt{75}$        $6\frac{2}{7}$        $12.\overline{67}$        $\sqrt{121}$        $\frac{12}{5}$        $\pi$



2. Graph and label each number on the number line below. You may label the number with the letter.

- A 0.75
- B  $\sqrt{3}$
- C  $\sqrt{9}$
- D  $-2\frac{1}{2}$
- E  $-\frac{15}{10}$
- F  $2.\overline{6}$
- G  $-\sqrt{2}$
- H  $\pi$

