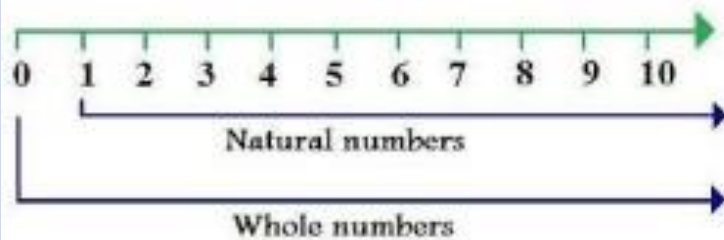# THE REAL NUMBER SYSTEM

(It's about to get "real")

NATURAL NUMBERS

The set of numbers 1, 2, 3, 4, ... Also called counting numbers.

WHOLE NUMBER

counting numbers such as 1,2,3,4 and also zero
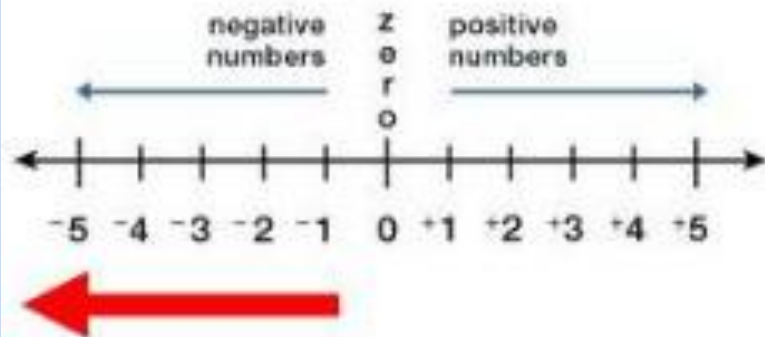
INTEGERS

All whole numbers (both positive and negative) and zero.

POSITIVE INTEGERS
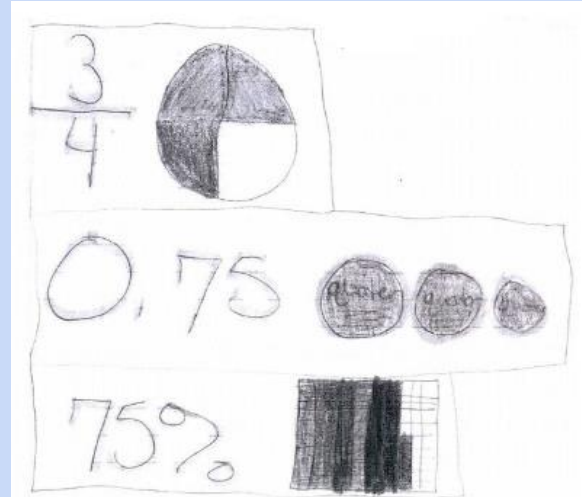

whole numbers greater than zero

NEGATIVE INTEGERS

RATIONAL NUMBERS

Any number that can be expressed as a fraction

$$\frac{3}{4}$$

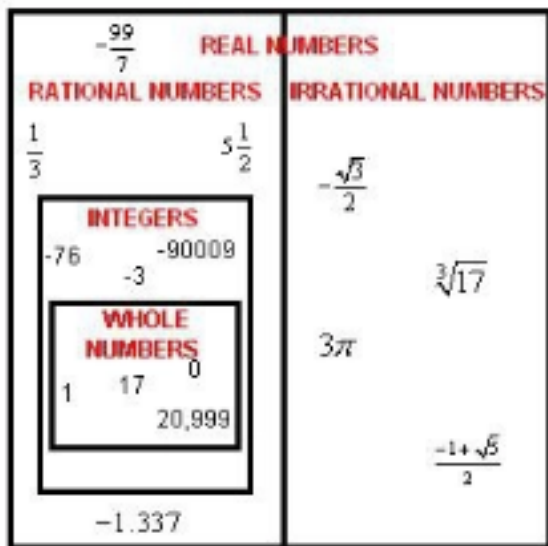0.75

75%

IRRATIONAL NUMBERS

irrational number $\Rightarrow \sqrt{19} \approx 4.35889\ldots$

rational number $\Rightarrow 0.5 = \dfrac{1}{2}$

numbers that can not be written as fractions

REAL NUMBERS

the set of all rational and irrational numbers

REPEATING DECIMAL

$$\frac{1}{9} = .111111111111\ldots$$

A decimal that repeats a digit or group of digits forever.

TERMINATING DECIMALS

1.3   decimals that end.

NON-TERMINATING DECIMALS

decimals digits are repeated forever

PERFECT SQUARES

$$\sqrt{1} = 1 \text{ since } 1^2 = 1$$
$$\sqrt{4} = 2 \text{ since } 2^2 = 4$$
$$\sqrt{9} = 3 \text{ since } 3^2 = 9$$
$$\sqrt{16} = 4 \text{ since } 4^2 = 16$$
$$\sqrt{25} = 5 \text{ since } 5^2 = 25$$
$$\sqrt{36} = 6 \text{ since } 6^2 = 36$$
$$\sqrt{49} = 7 \text{ since } 7^2 = 49$$
$$\sqrt{64} = 8 \text{ since } 8^2 = 64$$
$$\sqrt{81} = 9 \text{ since } 9^2 = 81$$
$$\sqrt{100} = 10 \text{ since } 10^2 = 100$$

a number that is the square of an integer

NON-PERFECT SQUARES

A rational number whose square root is not a whole number.

EXAMPLES: 3, 5, 8, 10   PERFECT SQUARE EXAMPLES: 4, 36, 100