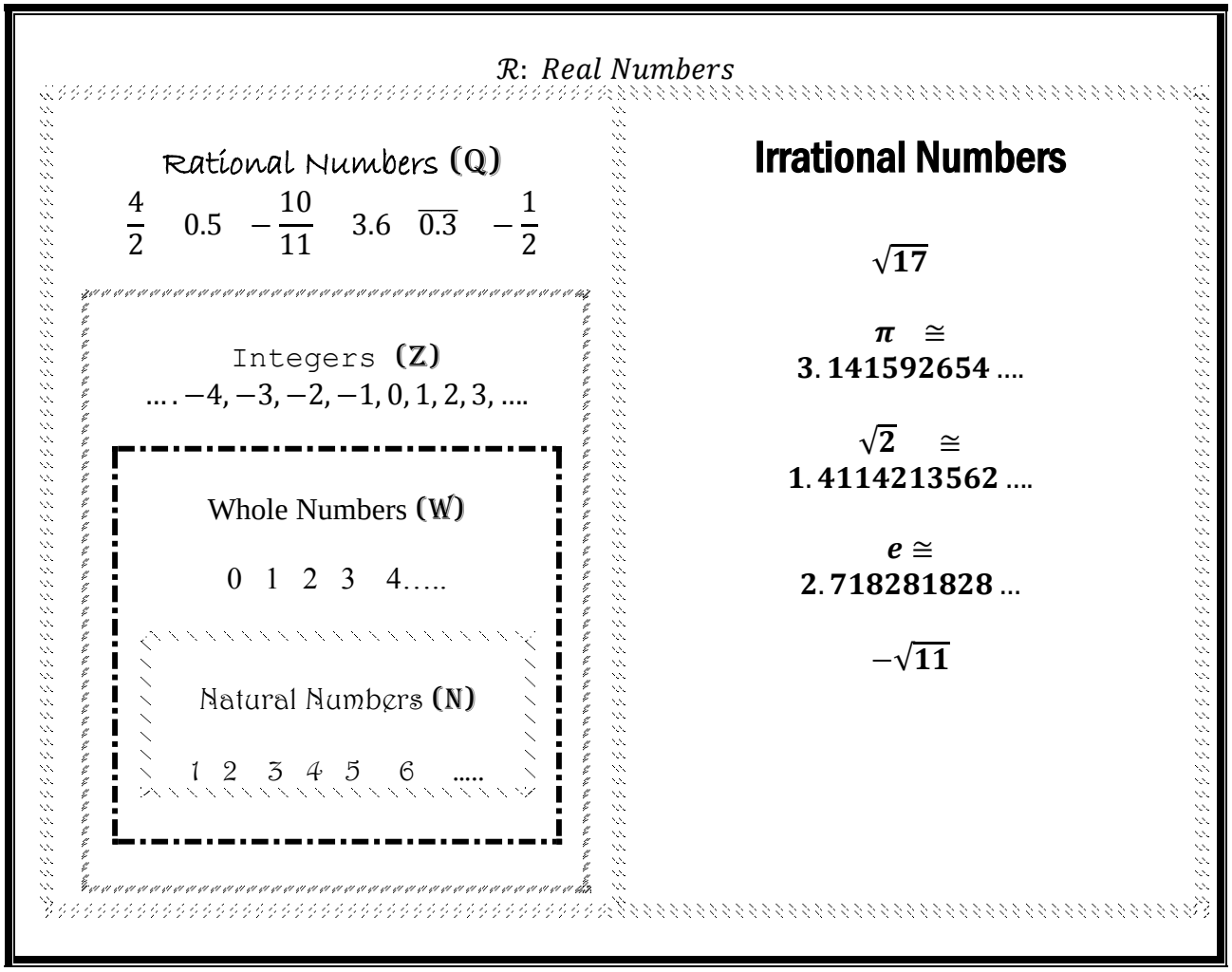
Algebra 2
Lesson 1-1: Properties of Real Numbers
Mrs. Snow, Instructor

There are five (5) sets of numbers that form the foundation for all of the mathematics. The three dots (. . .) is a notation used to mean "and so on and so on into infinity." The following diagram shows their relationships to one another:



Notice that some numbers can belong to several sets of numbers while others can belong to only one set of numbers. For example, 3 can belong to all of the sets of numbers except Irrational Numbers. Why?

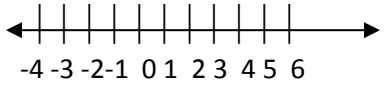
The number 0.25 can belong to only the set of real numbers and _____numbers. Then number $\sqrt{11}$ can only belong to the_____ and real numbers.

Number sets can be represented in several ways:

Words: The set of numbers on a six-sided die are 1 through 6.

Roster: {1, 2, 3, 4, 5, 6}

Interval: [1,6]
Number Line:



Set Builder notation: $\{x \mid x \text{ is an integer and } 1 \leq x \leq 6\}$ read as "the set of all x's such that x is an integer between 1 and 6 inclusive."

Interval notation: **[** or **]** means the number is included, while **(** or **)** means number is not included.

1. Classify each number to the sets of number it belongs.

a) -2.4

b) $\sqrt{30}$

c) 2π

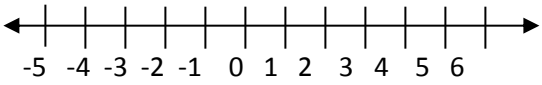
d) $\frac{-5}{2}$

2. Order the list of numbers from least to greatest.

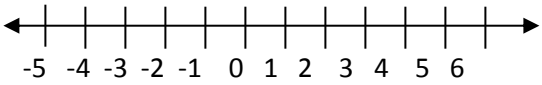
5, $\sqrt{17}$, -2.3, $-2\frac{3}{7}$, $\frac{2\pi}{3}$, 6.3333

5. Fill in the number lines.

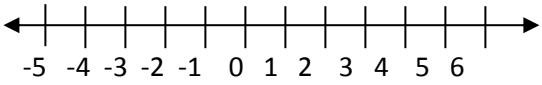
a) $-2 \leq x \leq 4$



b)The set of integers between -3 and 5.

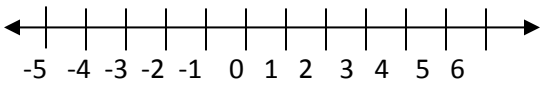


c) $y \neq 2$.



3. a) Rewrite $x \geq -1$ in interval notation.

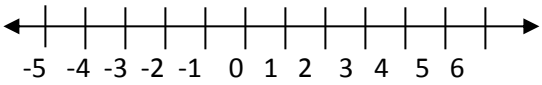
b) Rewrite [-2,3] as a number line.



c) Rewrite the set of even integers between 6 and 24 inclusive in roster notation.

d)Rewrite {2, 4, 6, …, 20} in words.

6. Use a number line to represent $[-1,2) and\ (3,+\infty)$ on a number line.



7. Translate, "the multiples of 4 from 1 to 100" into a roster.

8. What is the main difference between an undefined quantity and an irrational number?

4. Answer with **True or False.**

a) Every integer is a whole number

b) Every integer is a rational number

c) Every irrational is not a whole number.

d) A repeating decimal like 2.3333…. is an example of a rational number.

e) A number like $\frac{4}{0}$ is an irrational number.

9. The formula for the area of a circle is: $\pi\, r^2$

Will the area for circle ever be a rational number? Briefly explain.

10. Will the product of two irrational numbers ever be rational? Briefly explain.