

SETS

Real Numbers

Note: A real number is any number that has a location on the real number line.

These are some subsets of the set of real numbers:

- Counting or natural numbers
- Whole numbers
- Integers
- Rational numbers

A rational number is any number that can be written in the form $\frac{a}{b}$ where a and b are integers and $b \neq 0$.

Note: Numbers represented by either a terminating decimal or a repeating decimal are rational numbers.

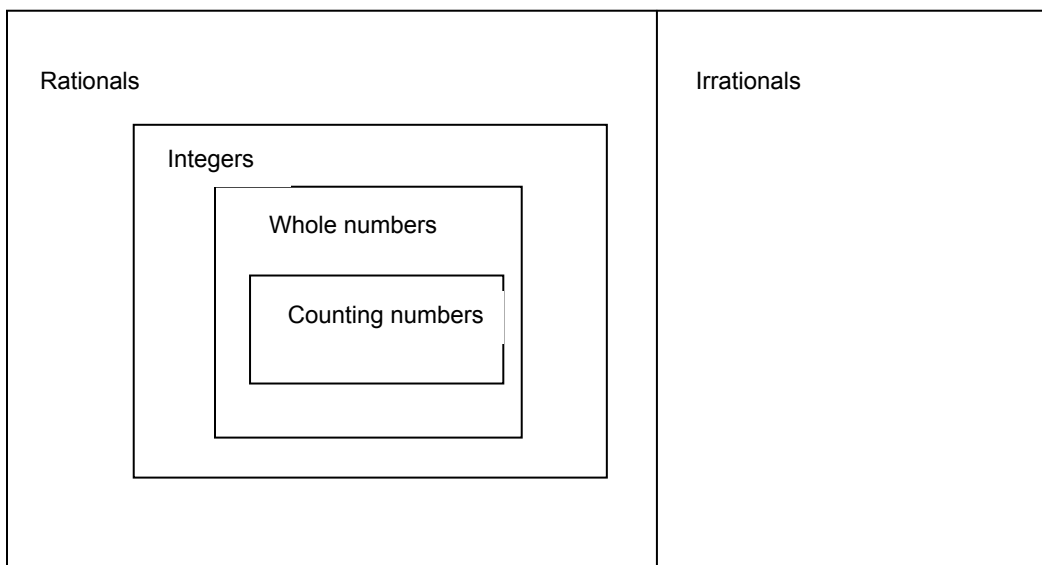
- Irrational numbers

An irrational number is a real number that is not rational.

Note: A number represented by a non-terminating, non-repeating decimal number is an irrational number.

A Venn Diagram of the Real Numbers

Real Numbers



1. If $C = \{1, 2, 3, 4, 5, 6\}$ and $D = \{4, 5, 6, 7, 8, 9\}$, then:
 - a. What is the union of C with D?
 - b. What is the intersection of C with D?

2. Determine set B if
 $A = \{1, 2, 3, 4, 5, 6, 7\}$, B is a subset of A, and the elements of B are even.

3. What is the intersection of
 $A = \{x \mid x \text{ is an odd integer}\}$ and
 $B = \{x \mid -4 < x < 6, \text{ where } x \text{ is an integer}\}$?

4. What is the union of
 $A = \{x \text{ is a natural number between 4 and 8, inclusive}\}$
and $B = \{x \text{ is a single-digit negative integer}\}$?

What is the intersection of sets A and B?