

MTH1W Grade 9 Mathematics

1.1 The Numbers We Use: Sets and Subsets

- Goal(s)**
- Describe subsets of number systems and how they are defined
 - Describe the similarities and differences between subsets of numbers

Page 8 #s 1aceg, 2, 4, 5be, 6, 7, 8, 9

Page 9 #s 10, 16, 17, 21

A **set** is a collection of objects that all have a *common property*.

Items of clothes you wear is a set. { hat, shoes, shorts... }

Types of fruit are a set. { apple, pear, orange... }

In math, elements of a set are contained within **curly brackets**.

a value or item in a set

The **three dots** (ellipses) indicate that a *set continues*, that there are more elements that share the common property.

*technically they
are known as BRACES*

Sets can be **finite** (they have a *beginning and an end*).

The set of whole numbers between 1 and 5.

$$\{ 1, 2, 3, 4, 5 \}$$

no other values in the set

Sets can be **infinite** (*continue forever*).

The set of positive and negative integers.

$$\{ \dots -3, -2, -1, 0, 1, 2, 3 \dots \}$$

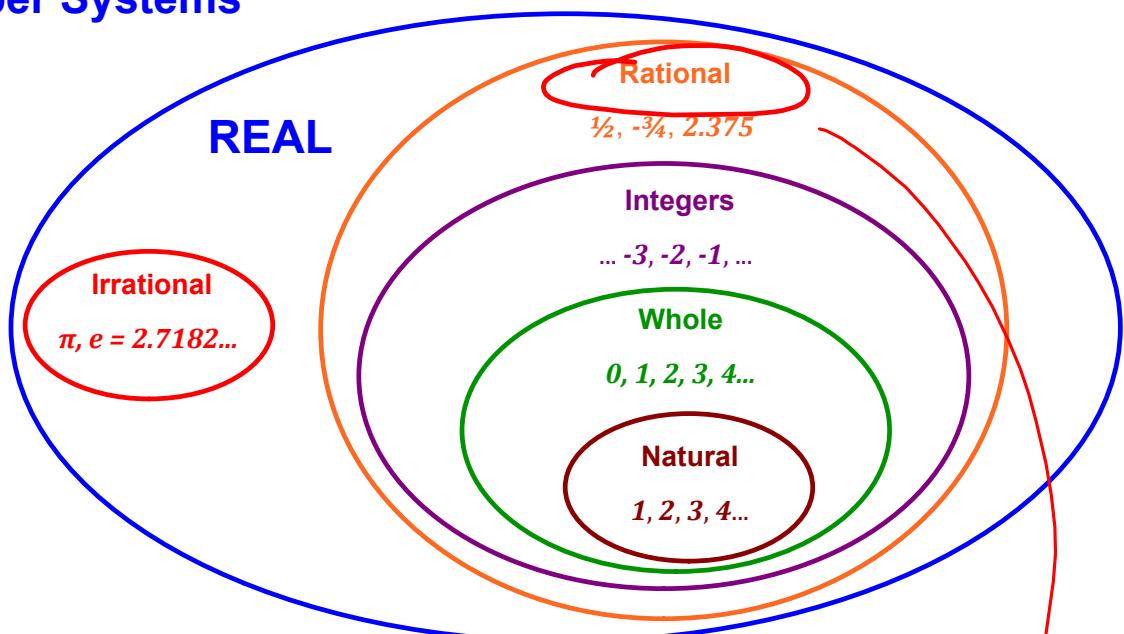
can have other values as well

Sets can have **conditions**.

All values of the variable 'x' greater than 12.

$$\{ x \mid x > 12 \}$$

Number Systems



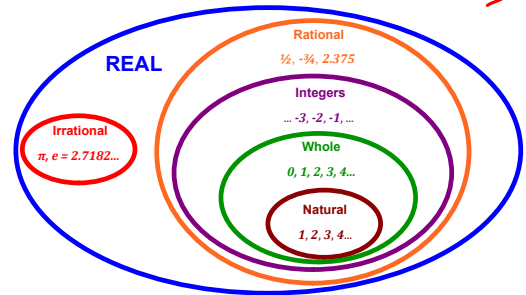
A **subset** is a *smaller set within a set*. For example, the set of *whole numbers* is a **subset** of the set of *integers*.

can be written as a fraction (or decimal)

Using *set notation*, list the set of **natural numbers** from **8** to **19**.

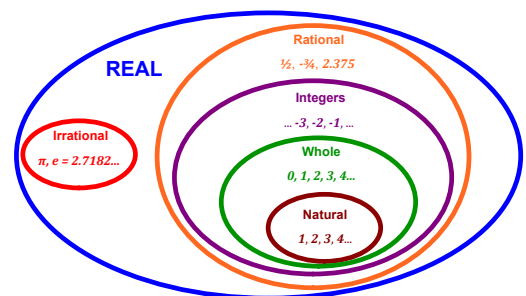
use curly brackets

$$\Rightarrow \{8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19\}$$



Using *set notation*, list the set of **odd integers** from **-6** to **5**.

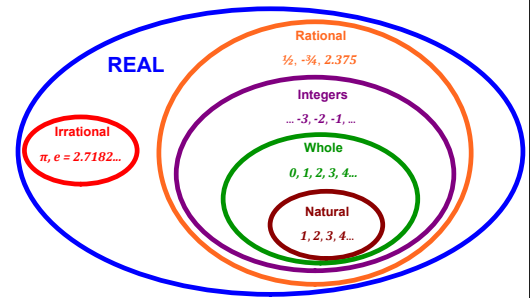
$$\{-5, -3, -1, 1, 3, 5\}$$



Using *set notation*, list the set of all integers that are multiples of 4.

This is an INFINITE Set.

$\{ \dots -12, -8, -4, 0, 4, 8, 12, 16, \dots \}$



Given: $\{-4, -3, -2, -1, 0, 1, 2, \dots\}$

Identify:

The beginning of the set. -4

The end of the set. $+\infty$

3 possible subsets. $\{-1, 0, 1\}$ $\{1, 2, 3\}$ $\{-4, -2, 0\}$

A non-subset.

$\{-10, -8, -6\}$

values NOT in the original set.

For each of the number sets, list its subsets.

Set	Subsets
irrational	None (can't be broken down)
whole	Natural numbers
integers	Natural numbers, Whole numbers
real	Irrational, Rational, Integers, Natural, Whole numbers