

SETS OF NUMBERS

\mathbb{N} - Natural Numbers
 $\{1, 2, 3, 4, \dots\}$

\mathbb{W} - Whole Numbers
 $\{0, 1, 2, \dots\}$

\mathbb{Z} - Integers
 $\{\dots, -3, -2, -1, 0, 1, 2, 3, \dots\}$

\mathbb{Q} - Rational Numbers

- Fractions
- Terminating Decimals
- Repeating Decimals

\mathbb{Q}' - Irrational Numbers

- Can't be expressed as fractions
- Non terminating, non repeating decimals
- $\pi, \sqrt{2}, e$

\mathbb{R} - Real numbers

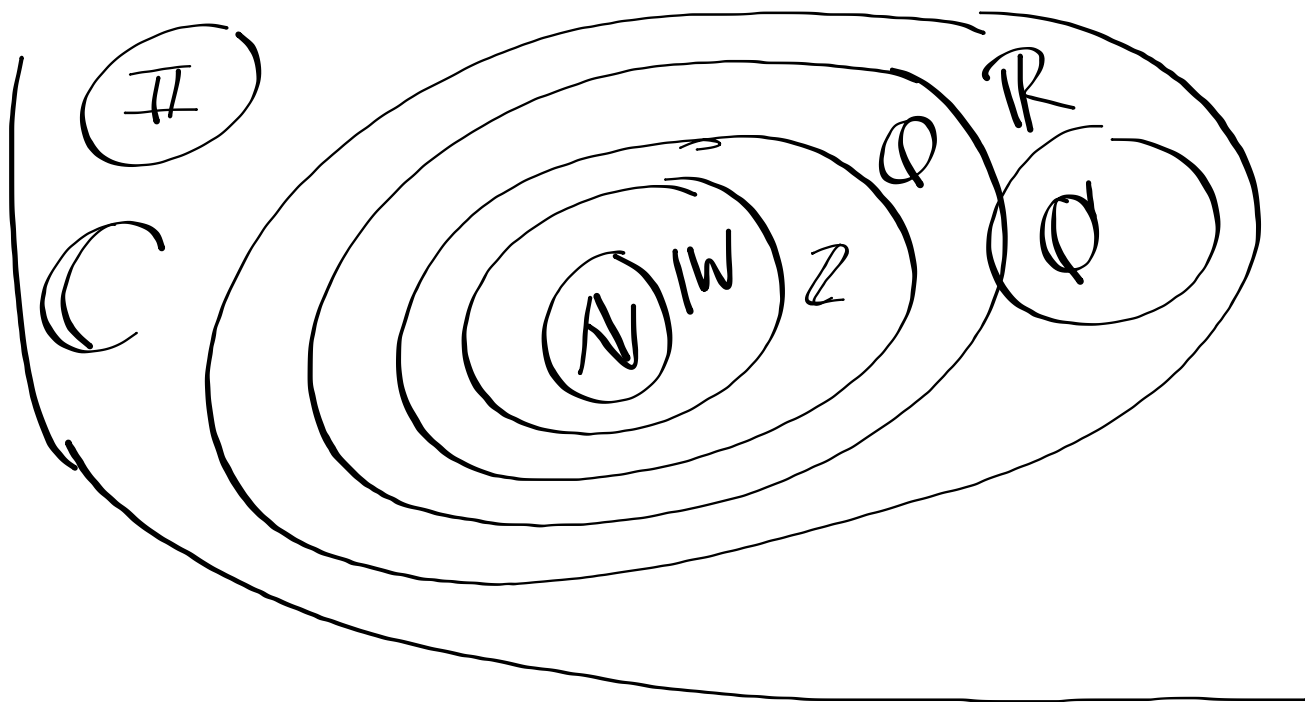
- All rational and irrational numbers
- $\mathbb{Q} \cup \mathbb{Q}'$

\mathbb{I} - Imaginary Numbers

- Not real numbers
- Satisfied by $i^2 = -1$

\mathbb{C} - Complex Numbers

- In the form $a + bi$



Set-Builder Notation

$$\{x \mid -3 \leq x \leq 16, x \in \mathbb{Z}\}$$

The set of all x such that x is greater than or equal to -3 and x is less than or equal to 16 , given x is an element of the integers.

$$\rightarrow -3, -2, -1, 0, 1, 2, \dots, 16$$

$$\{8, 9, 10, 11, \dots\}$$

$$* \{x \mid x \geq 8, x \in \mathbb{W}\}$$

$$* \{x \mid x \geq 8, x \in \mathbb{N}\}$$

$$* \{x \mid x > 7, x \in \mathbb{Z}\}$$

.

$$- \{ \dots, -14, -13, -12 \}$$

$$\{ x \mid x \leq -12, x \in \mathbb{Z} \}$$

All multiples of 3

$$\{x \mid x = 3n, n \in \mathbb{Z}\}$$

INTERVAL NOTATION

$()$ - Not equal to

$[]$ - Equal to.

$$1 < x \leq 5$$

$$(1, 5]$$

$$x \leq 3 \text{ OR } x \geq 7$$

$$(-\infty, 3] \cup$$

$$[7, +\infty)$$

Ex.

$$x \geq 11$$



$$[11, +\infty)$$

$$x < 6$$



$$(-\infty, 6)$$