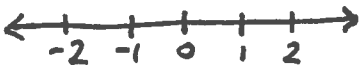


§ Sets

Natural numbers $\mathbb{N} = \{1, 2, 3, 4, \dots\}$, $3 \in \mathbb{N}$, $1735 \in \mathbb{N}$

Integers $\mathbb{Z} = \{\dots, -2, -1, 0, 1, 2, \dots\}$, $-57 \in \mathbb{Z}$, $\frac{1}{3} \notin \mathbb{Z}$

Rational numbers $\mathbb{Q} = \left\{ \frac{n}{m} \mid n, m \in \mathbb{Z} \text{ and } m \neq 0 \right\}$, $\frac{3}{5} \in \mathbb{Q}$, $-\frac{4}{7} \in \mathbb{Q}$

Real numbers \mathbb{R}  , $\pi \in \mathbb{R}$, $\sqrt{2} \in \mathbb{R}$

$$\boxed{\mathbb{N} \subseteq \mathbb{Z} \subseteq \mathbb{Q} \subseteq \mathbb{R}}$$

$$S = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$$

$$T = \left\{ x \in S \mid \frac{x}{3} \in \mathbb{Z} \right\}$$

$$W = \{x \in T \mid x > 8\}$$

$$U = \{x \in S \mid x \in \mathbb{N}\}$$

$$F = \{x \in S \mid x \leq 4\}$$

$$G = \{x \in F \mid x \in T\}$$

$$R = \left\{ x \in S \mid \frac{x}{7} \in \mathbb{Q} \right\}$$

$$N = \{x \in S \mid x < 0\}$$

Intervals

$$a, b \in \mathbb{R}, a \leq b$$

$$[a, b] = \{x \in \mathbb{R} \mid a \leq x \leq b\}$$

$$[a, b) = \{x \in \mathbb{R} \mid a \leq x < b\}$$

$$(a, b] = \{x \in \mathbb{R} \mid a < x \leq b\}$$

$$(a, b) = \{x \in \mathbb{R} \mid a < x < b\}$$

$$[a, \infty) = \{x \in \mathbb{R} \mid a \leq x\}$$

$$(a, \infty) = \{x \in \mathbb{R} \mid a < x\}$$

$$(-\infty, b] = \{x \in \mathbb{R} \mid x \leq b\}$$

$$(-\infty, b) = \{x \in \mathbb{R} \mid x < b\}$$



$$(1, 3) \text{ — } (-12, 37)$$

$$1 \text{ — } (1, 3)$$

$$2 \text{ — } (3, 5)$$

$$4 \text{ — } [4, 7)$$

$$[2, 8) \text{ — } (2, 8)$$

$$7 \text{ — } \mathbb{R} - \{3, 7, 8\}$$

$$6 \text{ — } (-12, 6)$$

$$(-8, 23) \text{ — } [-8, 50)$$

$$(0, 100] \text{ — } \mathbb{R} - \{3\}$$

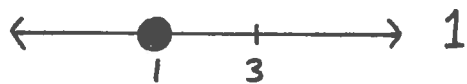
$$[15, 30) \text{ — } \mathbb{R} - \{3\}$$



$$(1, 3) \subseteq (-12, 37)$$



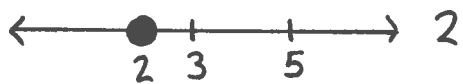
$$7 \notin \mathbb{R} - \{3, 7, 8\}$$



$$1 \notin (1, 3)$$



$$6 \notin (-12, 6)$$



$$2 \notin (3, 5)$$



$$(-8, 23) \subseteq [-8, 50)$$



$$4 \in [4, 7)$$



$$3 \in (0, 100], \text{ but } 3 \notin \mathbb{R} - \{3\},$$

$$\text{so } (0, 100] \not\subseteq \mathbb{R} - \{3\}$$



$$2 \in [2, 8), \text{ but } 2 \notin (2, 8),$$

$$\text{so } [2, 8) \not\subseteq (2, 8)$$



$$[15, 30) \subseteq \mathbb{R} - \{3\}$$