

$(1 \neq 0)$.

Axiom 10 (existence of multiplicative inverse): $\forall x \in \mathbb{R} \ni x \neq 0 \exists$ a unique number x^{-1}

$$\ni x \cdot (x^{-1}) = 1$$

Axiom 11 (distributive of multiplication over addition): $\forall x, y, z \in \mathbb{R}, x \cdot (y + z) = (x \cdot y) + (x \cdot z)$

The Order Axioms of \mathbb{R}

Axiom 12 (trichotomy): $\forall x, y \in \mathbb{R}$, exactly one of the following relationships exists between x and y

: $x < y, x = y, \vee x > y$. $[(x < y) \text{ exor } (x = y) \text{ exor } (x > y)]$

Axiom 13 (transitive): $\forall x, y, z \in \mathbb{R}, [(x < y) \wedge (y < z)] \Rightarrow (x < z)$

Axiom 14 (preservation of order under addition): $\forall x, y, z \in \mathbb{R}, (x < y) \Rightarrow (x + z < y + z)$

Axiom 15 (preservation of order for positive multiplier): $\forall x, y \in \mathbb{R}, [(x < y) \wedge (0 < z)] \Rightarrow$

$$(x \cdot z < y \cdot z)$$

The Completeness Axiom of \mathbb{R}

Axiom 16 (completeness): $\forall A \subseteq \mathbb{R} \ni A$ is bounded above \exists a number m which is the supremum of the set