

ADDITION AXIOMS



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CLOSURE LAW: This law indicates that the sum of two real numbers (\mathbb{R}) will result in a real number. Hence:

$$\forall a \wedge b \in \mathbb{R}; a + b \in \mathbb{R}$$

COMMUTATIVE LAW: This law indicates that the sum of two numbers $a + b$ is equivalent to adding $b + a$. Hence:

$$\forall a \wedge b \in \mathbb{R}; a + b = b + a$$

ASSOCIATIVE LAW: indicates that, given three Real numbers (\mathbb{R}), we can group two of those numbers (with grouping symbols) to add them up; and the result is added with the remaining number. Hence:

$$a, b \wedge c \in \mathbb{R}; (a + b) + c = a + (b + c) = b + (a + c)$$

EXISTENCE AND UNIQUENESS OF THE ADDITIVE NEUTRAL ELEMENT: there is one and only one element denoted as zero such that, the sum of that additive neutral element with any real number results in the same real number. Hence: "0" / $\forall a \in \mathbb{R}; a + 0 = a = 0 + a$

EXISTENCE AND UNIQUENESS OF THE ADDITIVE INVERSE: For each real number "a", there is one and only one element denoted by "-a" in such a way that adding them results in zero. Hence:

$$\text{If } a \in \mathbb{R} \Rightarrow "-a" / a + (-a) = 0 = -a + a$$

AXIOM: it is an evident proposition or statement that does not need proof and allows new statements to be deduced.



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