

properties of operations

Associative property of addition	$(a + b) + c = a + (b + c)$
Commutative property of addition	$a + b = b + a$
Additive identity property of 0	$a + 0 = 0 + a = a$
Existence of additive inverses	For every a there exists $-a$ so that $a + (-a) = (-a) + a = 0$.
Associative property of multiplication	$(a \times b) \times c = a \times (b \times c)$
Commutative property of multiplication	$a \times b = b \times a$
Multiplicative identity property of 1	$a \times 1 = 1 \times a = a$
Existence of multiplicative inverses	For every $a \neq 0$ there exists $1/a$ so that $a \times 1/a = 1/a \times a = 1$.
Distributive property of multiplication over addition	$a \times (b + c) = a \times b + a \times c$

Expressions & Equations

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Expressions & Equations

associative property of multiplication

associate: group

$$(a \cdot b) \cdot c = a \cdot (b \cdot c)$$

$$2 \cdot (3 \cdot 4) = 24 \quad (2 \cdot 3) \cdot 4 = 24$$

The grouping of factors doesn't change their product.

Expressions & Equations

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Expressions & Equations

commutative property of multiplication

commute: move

$$a \cdot b = b \cdot a$$

$$2 \cdot 4 = 8 \quad 4 \cdot 2 = 8$$

The order of factors doesn't change their product.

Expressions & Equations

commutative property of multiplication

commute: move

$$a \cdot b = b \cdot a$$

$$2 \cdot 4 = 8 \quad 4 \cdot 2 = 8$$

The order of factors doesn't change their product.

Expressions & Equations

distributive property

The distributive property of multiplication: the product of a number and a sum is equal to the sum of the products of the addends and the number.

$$a(\underbrace{b + c}_{\text{addend}}) = \underbrace{a \cdot b}_{\text{number}} + \underbrace{a \cdot c}_{\text{addend}}$$

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