

Math Sheet

Name _____ Score _____ Teacher _____ Date _____

Mathematical Properties Reference

Use these definitions and examples to compare nineteen mathematical properties.

Associative property of addition

Changing only the grouping of three addends does not change their sum.

$$(a + b) + c = a + (b + c)$$

Associative property of multiplication

Changing only the grouping of three factors does not change their product.

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

Commutative property of addition

Changing the order of two addends does not change their sum.

$$a + b = b + a$$

Commutative property of multiplication

Changing the order of two factors does not change their product.

$$a \times b = b \times a$$

Distributive property

Multiplying a sum by a factor equals adding the products of that factor and each addend.

$$(a + b) \times c = a \times c + b \times c$$

Additive identity property

Adding zero leaves a number unchanged.

$$a + 0 = a$$

Equivalent name: Addition property of zero

Multiplicative identity property

Multiplying by one leaves a number unchanged.

$$a \times 1 = a$$

Additive inverse property

A number plus its opposite equals zero.

$$a + (-a) = 0$$

Multiplicative inverse property

A nonzero number times its reciprocal equals one.

$$a \neq 0 \Rightarrow a \times \left(\frac{1}{a}\right) = 1$$

Addition property of zero

Adding zero leaves a number unchanged.

$$0 + a = a$$

Equivalent name: Additive identity property

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Mathematical Properties Reference

Use these definitions and examples to compare nineteen mathematical properties.

Multiplication property of zero

Any number multiplied by zero equals zero.

$$a \times 0 = 0$$

Property of equality

An equation is true when both sides have the same value.

$$3 + 4 = 5 + 2$$

Addition property of equality

Adding the same quantity to equal expressions preserves equality.

$$a = b \Rightarrow a + c = b + c$$

Subtraction property of equality

Subtracting the same quantity from equal expressions preserves equality.

$$a = b \Rightarrow a - c = b - c$$

Multiplication property of equality

Multiplying equal expressions by the same quantity preserves equality.

$$a = b \Rightarrow a \times c = b \times c$$

Division property of equality

Dividing equal expressions by the same nonzero quantity preserves equality.

$$a = b, c \neq 0 \Rightarrow \frac{a}{c} = \frac{b}{c}$$

Reflexive property of equality

Every expression is equal to itself.

$$a = a$$

Symmetric property of equality

If one expression equals another, the equality may be reversed.

$$a = b \Rightarrow b = a$$

Transitive property of equality

Expressions equal to the same expression are equal to each other.

$$a = b, b = c \Rightarrow a = c$$