

Properties of the Real Number System

Closure property -- operating on any two elements of the set yields a number in the set.

EXAMPLE: whole number + whole number = whole number

Commutative property -- operating on two elements of the set can be done in any order.

EXAMPLE: $5 + 7 = 7 + 5$

Associative property -- operating on three or more elements of the set can be done in any order.

EXAMPLE: $(3 \times 6) \times 2 = 3 \times (6 \times 2)$

Identity element property -- operating on any number of the set with the identity element yields the original number.

EXAMPLES: $0 + 4 = 4$ $7 \times 1 = 7$ $0 + 13 = 13$ $1 \times -89 = -89$

What is the identity element for addition?

What is the identity element for multiplication?

Why isn't there an identity element for subtraction?

Why isn't there an identity element for division?

Zero multiplication property -- multiplying by zero always gives zero.

EXAMPLES: $0 \times 9.35 = 0$ $3\pi \times 0 = 0$

Distributive property -- distribution of multiplication over addition/subtraction in the parentheses.

EXAMPLE: $3(4 + 8) = 3(4) + 3(8) = 12 + 24 = 36$

Inverse property -- operating with a number and its "inverse" gives the identity element.

EXAMPLES: $7 + (-7) = 0$ $4 \times (1/4) = 1$ $(-2/3) + 2/3 = 0$ $-65 + 65 = 0$

What is the additive inverse of -6?

What is the multiplicative inverse of -6?