Commutative Property of Multiplication

Symmetric Property of Equality

Additive Identity Property

Transitive Property of Equality

Multiplication Identity Property

Substitution Property of Equality

Multiplication Property of Zero

Distributive Property

Additive Inverse Property

Commutative Property of Addition

For any numbers a and b,
if $a = b$, then $b = a$.

For any numbers a and b,
$a \cdot b = b \cdot a$

For any numbers a, b, and c,
if $a = b$ **and** $b = c$,
then $a = c$.

For any number a,
$a + 0 = 0 + a = a$.

If $a = b$, then
a may be ***replaced*** by b
in any expression.

For any number a,
$a \cdot 1 = 1 \cdot a = a$.

For any numbers a, b, and c,
a) $a(b+c) = ab + ac$ and
$(b+c)a = ba + ca$;
b) $a(b-c) = ab - ac$ and
$(b-c)a = ba - ca$;

For any number a,
$a \cdot 0 = 0 \cdot a = 0$.

For any numbers a and b,
$a + b = b + a$.

For every number a,
there is exactly one number $-a$
such that $a + (-a) = 0$.

Subtraction Property for Inequalities

Multiplication Inverse Property

Multiplication Property for Inequalities

Reflexive Property of Equality

Associative Property of Addition

Zero Product Property

Associative Property of Multiplication

Trichotomy Property

Addition Property of Equality

Addition Property for Inequalities

For every nonzero number $\frac{a}{b}$, where $a \neq 0$ and $b \neq 0$, there's exactly one number $\frac{b}{a}$ such that $\frac{a}{b} \cdot \frac{b}{a} = 1$.

Equivalently, for every $a \neq 0$, $a \cdot \frac{1}{a} = 1$.

For any real numbers, a, b, and c,
if $a > b$, then $a - c > b - c$,
if $a < b$, then $a - c < b - c$.

For any number a, $a = a$.

For any real numbers, a, b, and c,
if c is ***positive*** and a) $a > b$, then $ac > bc$ b) $a < b$, then $ac < bc$.
If c is ***negative*** and a) $a > b$, then $ac < bc$ b) $a < b$, then $ac > bc$.

If $a \cdot b = 0$, then either $a = 0$ or $b = 0$.

For any numbers a, b, and c,
$(a+b)+c = a+(b+c)$.

For any two real numbers, a and b, exactly one of the following statements is true:
$a < b$, $a = b$, or $a > b$

For any numbers a, b, and c,
$(ab)c = a(bc)$.

For any real numbers, a, b, and c,
if $a > b$, then $a + c > b + c$,
if $a < b$, then $a + c < b + c$.

For any numbers a, b, and c,
if $a = b$, then $a + c = b + c$.

Subtraction Property of Equality

Multiplication Property of Equality

Division Property of Equality

Division Property for Inequalities

For any numbers a, b, and c,
if $a = b$, then $a - c = b - c$.

For any numbers a, b, and c,
if $a = b$, then $ac = bc$.

For any numbers a, b, and c, if

$a = b$ and $c \neq 0$, then $\frac{a}{c} = \frac{b}{c}$.

For any real numbers, a, b, and c,
if c is ***positive*** and a) $a > b$, then $\frac{a}{c} > \frac{b}{c}$,

b) $a < b$, then $\frac{a}{c} < \frac{b}{c}$, and

if c is ***negative*** and a) $a > b$, then $\frac{a}{c} < \frac{b}{c}$,

b) $a < b$, then $\frac{a}{c} > \frac{b}{c}$.