Properties of Real Numbers

Suppose ***a***, ***b,*** and ***c*** represent real numbers.

1) Closure Property of Addition
- Property: ***a + b*** is a real number
- Description: If you add two real numbers, the sum is also a real number.

2) Commutative Property of Addition
- Property: ***a + b = b + a***
- Description: If you add two real numbers in any order, the sum will always be the same or equal.

3) Associative Property of Addition
- Property: ***(a + b) + c = a + (b + c)***
- Description: If you are adding three real numbers, the sum is always the same regardless of their grouping.

4) Additive Identity Property of Addition
- Property: ***a + 0 = a***
- Description: If you add a real number to zero, the sum will be the original number itself.

5) Additive Inverse Property
- Property: ***a + (– a) = 0***
- Description: If you add a real number and its opposite, you will always get zero.

6) Closure Property of Multiplication
- Property: ***a × b*** is a real number.
- Description: If you multiply two real numbers, the product is also a real number.

7) Commutative Property of Multiplication
- Property: ***a × b = b × a***
- Description: If you multiply two real numbers in any order, the product will always be the same or equal.

8) Associative Property of Multiplication
- Property: ***(a × b) × c = a × (b × c)***
- Description: If you are multiplying three real numbers, the product is always the same regardless of their grouping.

9) Multiplicative Identity Property of Multiplication
- Property: ***a × 1 = a***
- Description: If you multiply a real number to one (1), you will get the original number itself.

10) Multiplicative Inverse Property
- Property: ***a × (1/a) = 1*** but ***a ≠ 0***
- Description: If you multiply a nonzero real number by its inverse or reciprocal, the product will always be one (1).

11) Distributive Property of Multiplication over Addition
- Property: ***a(b + c) = ab + ac*** or ***(a + b)c = ac + bc***
- Description: The operation of multiplication distributes over addition operation.