Properties of Multiplication

Closure Property: If a and b are two integers, then a × b will also be an integer. This is called the closure property of multiplication of integers.

Example: 7 × (-5) = (-35)

Commutative Property: If a and b are two integers, then $\mathbf{a} \times \mathbf{b} = \mathbf{b} \times \mathbf{a}$, i.e., on changing the order of integers, we get the same result. This is called the commutative property of multiplication of integers.

Example: $6 \times 9 = 9 \times 6 = 54$

Thus, the commutative property holds good for the multiplication of integers.

Associative Property: If a, b and c are three integers, then a × (b × c) = (a × b) × c. This is called the associative property of multiplication of integers.

Example: $[(-5) \times 2] \times (-3) = (-5) \times [2 \times (-3)]$

Or $(-10) \times (-3) = (-5) \times (-6)$

Or 30 = 30

Thus, associative property holds good for the multiplication of integers.

Multiplicative Identity: The product of any integer and 1 gives the same integer. If a is an integer, then $\mathbf{a} \times \mathbf{1} = \mathbf{a} = \mathbf{1} \times \mathbf{a}$. Hence, 1 is called the multiplicative identity.

Example: 19 × 1 = 1 × 19 = 19

Multiplicative Inverse: If a is an integer, then $\mathbf{a} \times \frac{1}{a} = \mathbf{1} = \frac{1}{a} \times \mathbf{a}$. Thus, an integer and its reciprocal are called the multiplicative inverse of each other.

Example: $9 \times \frac{1}{9} = 1 = \frac{1}{9} \times 9$

Property of Zero: The product of any integer and zero gives the result as zero. If a is an integer, then $a \times 0 = 0 = 0 \times a$.

Example: $9 \times 0 = 0 = 0 \times 9$

Associative property	$(a \times b) \times c = a \times (b \times c)$
Commutative property	a x b = b x a
Distributive property	a(b + c) = ab + ac a(b - c) = ab - ac
Identity property	a x 1 = a
Zero property	a x 0 = 0