Properties of Mathematics

**Additive inverse –**

The opposite of any number is its additive inverse. When we add a number and its additive inverse,
the **sum is zero**.

Examples: 5 + (-5) = 0 -27.3 + 27.3 = 0

**Multiplicative inverse –**

The reciprocal of a rational number is what we get when we “flip” it.

Examples: The reciprocal of $\frac{5}{8}$ is $\frac{8}{5}$. The reciprocal of 7 is $\frac{1}{7}$.

The reciprocal of any number is also its multiplicative inverse. When we multiply a number and its multiplicative inverse, the **product is one**.

Examples: $\frac{5}{8}×\frac{8}{5}$ = 1 $7×\frac{1}{7}=1$

**Commutative property of addition and multiplication –**

**Order** doesn’t matter when we ONLY add or ONLY multiply.

Examples: 3 + 5 + 7 = 7 + 3 + 5

 9 ⬝ 6 = 6 ⬝ 9

**Associative property of addition and multiplication –**

**Grouping** doesn’t matter when we ONLY add or ONLY multiply.

Examples: 5 + (12 + 4) = (5 + 12) +4

 (16 ⬝ 3) ⬝ 12 = 16 ⬝ (3 ⬝ 12)

**Identity element of addition –**

**Adding zero** doesn’t change a number.

Example: 14 + 0 = 14

**Identity element of multiplication –**

**Multiplying by 1** doesn’t change a number.

Examples: 27×1 = 27 1×(-5) = -5

**Distributive property –**

This property involves **two operations**: multiplying and adding (or subtracting).

Examples: 7 (3 + 5) = 7⬝3 + 7⬝5

 4 (12 – 8) = 4⬝12 – 4⬝8