# PEMDAS

# ORDER OF OPERATIONS

(Please excuse my dear Aunt Sally)

*When we have more than one operation used, we need to have rules to tell us in which order to do the operations.*

**Please** — Parenthesis/grouping symbols

$6(38-12)+4$
$6(26)+4$
$156+4$
$160$

$$\frac{3+2\bullet 5-4}{8\div 4+1}$$

$2[5(4+6)-3]$

**Excuse** — Exponents  for example: $7^2 = 7 \bullet 7 = 49$

$7+3\bullet 2^3$

**My Dear** — Multiplication and Division — Do from left to right.

$32\bullet 4\div 2$
$128\div 2$
$64$

$32\div 4\bullet 2$
$8\bullet 2$
$16$

**Aunt Sally** — Addition and Subtraction — Do from left to right.

$9+8-3$
$17-3$
$14$

$9-8+3$
$1+3$
$4$

Properties=always true about numbers and computation

**Properties of Addition**

Commutative Property of Addition => numbers move
*Examples:*
$$3 + 4 = 4 + 3$$
$$n + 5 = 5 + n$$
$$(2 + 3) + 5 = 5 + (2 + 3)$$

Associative Property of Addition => groups/parenthesis move
*Examples:*
$$(2 + 3) + 5 = 2 + (3 + 5)$$
$$(a + b) + c = a + (b + c)$$

Identity Number of Addition => add with zero
*Examples:*
$$0 + 5 = 5$$
$$n + 0 = n$$

**Properties of Multiplication**

Commutative Property of Multiplication => numbers move
*Examples:*
$$4 \cdot 3 = 3 \cdot 4$$
$$7n = n7$$

Associative Property of Multiplication => parenthesis move
*Examples:*
$$(2 \cdot 3)5 = 2(3 \cdot 5)$$

Identity Number of Multiplication => multiplying with the # one
*Examples:*
$$7 \cdot 1 = 7$$
$$n \cdot 1 = n$$

Zero Property of Multiplication => multiplying with zero
*Examples:*
$$7 \cdot 0 = 0$$
$$n \cdot 0 = 0$$

Distributive Property of Multiplication
*Examples:*
$$2(3 + 4) = 2 \cdot 3 + 2 \cdot 4$$
$$a(b + c) = ab + ac$$