Exponents

Just as multiplication involves repeated addition, there are instances where we encounter repeated multiplication.

Answer each of the multiplication:

⇒ (+2) × (+2) × (+2) × (+2) × (+2) = _____

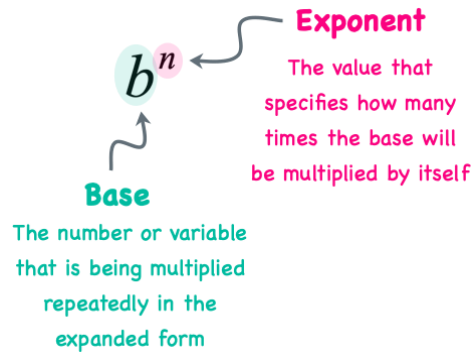
⇒ (-4) × (-4) × (-4) = _____

We can express this repeated multiplication by using what is called ***exponents***.

Rewrite the following using exponent notation.

⇒ (+2) × (+2) × (+2) × (+2) × (+2) = _____

⇒ (-4) × (-4) × (-4) = _____



Write each of the exponents as repeated multiplication and determine the result.

⇒ 3^3 = _____ = _____

⇒ $(-1)^5$ = _____ = _____

Just as with multiplication, if there is an ***odd*** exponent to a negative (-) base then the answer will be ***negative*** (-). If there is an ***even*** exponent to a negative (-) base then the answer will be ***positive*** (+).

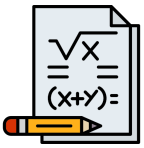
Caveat! Be careful if the base is negative or if the expression is negative.

Example:

⇒ 2^5 = _____ = _____

⇒ $(-2)^5$ = _____ = _____

⇒ -2^5 = _____ = _____



Complete the following:

a) 6^3 =____ b) $(-1)^4$ = ____ c) -3^3 = ____

d) -4^2 =____ e) 10^4 = ____ f) $(-5)^3$= ____

Order of Operations

Answer the following viral math problems:

⇒ 6 ÷ 2(1 + 2) = _____

⇒ 6^2 ÷ 2(3) + 4 = _____

⇒ 9 – 6 ÷ 3 + 1 = _____

As you can see you all got different answers to the same questions, but why is this?

These questions illustrate the importance of having a consistent set of rules/steps to follow, so everyone can get the same answer.

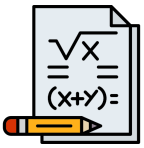
We call these steps **BEDMAS**

Brackets
Exponents
Division
Multiplication
Addition
Subtraction

Brackets
Exponents
Division – **M**ultiplication*
Addition – **S**ubtraction*

**Treated Equally Solve Left-to-Right*

In Math we refer to BEDMAS as the ***Order of Operations*** refers to the sequence in which mathematical operations should be performed within an expression. It ensures that everyone gets the same answer when solving a mathematical problem.



Let's try our original questions again, but this time using our new rules!

Re-try the following viral math problems:

⇒ $6 \div 2(1 + 2) =$ _____

⇒ $6^2 \div 2(3) + 4 =$ _____

⇒ $9 - 6 \div 3 + 1 =$ _____

Evaluate the following expressions:

a) $4 + 3 \times 2 =$ ____

b) $8 - (5 \times 2) + 4 =$ ____

c) $5 + (-3) \times 4 - 2 =$ ____

d) $(-10) \div 2 + 3 \times (4 - 1) =$ ____

e) $2 \times (3 + 5) - (-4) =$ ____

f) $12 - 3 \times (6 \div 2)^2 =$ ____

g) $(7 - 2) \times 3 + 4^2 =$ ____

h) $18 \div (4 - 1)^2 + 5 =$ ____

Understanding and applying the order of operations correctly is fundamental in mathematics. It ensures clarity and consistency in mathematical expressions and calculations. YOU MUST MASTER THIS SKILL!