SUPPLEMENTARY
MODULE 4

Add and Subtract Simple Monomials

GRADE 8

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ADD AND SUBTRACT SIMPLE MONOMIALS

■ ● ▲ wELCoME, LEaRnERS!

Greetings, amazing learners! If you're here, it means you're on the path to mastering the art of adding and subtracting monomials – and that's fantastic! If things are feeling a bit tricky, don't stress. We all learn at our own pace, and that's totally cool. This supplementary session is here for you, offering extra support and some friendly guidance. You're doing awesome, and we're here to cheer you on every step of the way!

Learning Objectives:

At the end of this lesson students will be able

1. Differentiate monomials from non-monomials;
2. Describe how to add and subtract monomials; and
3. Understand how important it is to grasp the addition and subtraction of monomials in order to solve mathematical difficulties
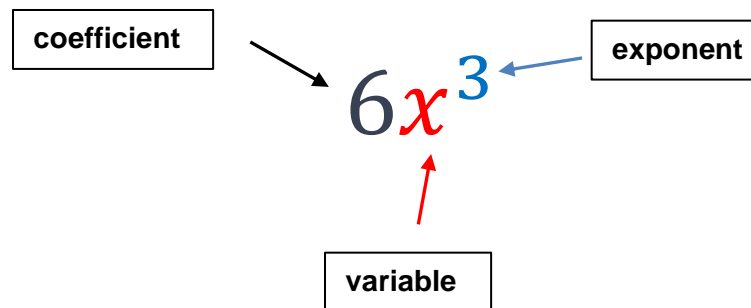
Introducing the Concept of Monomials

Explaining what monomial is:

A monomial is a single-term algebraic expression, comprising a coefficient (the constant multiplier), a variable (representing an unknown value), and an optional exponent indicating the variable's power.

Components of Monomials

coefficient   exponent

$$6x^3$$

variable

Coefficient:	The numerical factor in a monomial, such as 3 in 3x or -2 in -2y.
Variable	The letter or symbol representing the unknown quantity, like x in 3x or y in -2y.
Exponent	A small number indicating the power to which the variable is raised, e.g., the exponent of x is 1 in 3x.

Distinguishing Monomials from Non-Monomials

      Algebraic expressions with a single term, called monomials, are usually formed of variables, coefficients or constants, and their exponents, like -3y or 5x^2. Their distinguishing feature is their simplicity, signifying a single variable, a single value, or a product of multiple variables and variables. Non-monomials, on the other hand, consist of several terms joined by addition or subtraction. resulting in more intricate phrases like -2xy + 7 or 5x^2 + 3y.

Note: In case there is any confusion, $5x^2$ can be written as 5x^2. The ^ symbol denotes that the variable x is being raised to the power of 2.

Monomials	Not Monomials
3	3+x
9y	9a+b
36efg	23e+56g

Like Terms and Unlike Terms:

- Like Terms: Terms sharing the same variable(s) and exponent(s), multiplied by the same constant, e.g, 3x and 5x.

- Unlike Terms: Terms that differ in variables or exponents, such as 3x and 5y or -2y and 4y^2.

Like Terms	Unlike Terms
13y, y, -23y	2xy, 6yx, 10x
-12abc, 32abc, -1/2 abc	13dbc, 12bc,11db

We could imagine the terms like dog with the dogs and cat with the cats. In adding and subtracting monomials, we cannot combine dogs and cats or subtract dogs with the cats and vice versa. The only reason is that they are different animals.

Like Terms	Unlike Terms

The most important thing to remember in adding or subtracting monomials, it must be like terms.

Adding Monomials

1. Identify like terms (same variable, same power)
2. Combine by adding coefficients while maintaining variables and exponents.
3. Simplify by removing unnecessary coefficients or parentheses.

Given: 3x +5x

Step 1: The given are like terms having the same variable which is x and both raised to a power of 1.

Step 2: Since the variables are the same, we keep the variable (x) and add the coefficients 3 and 5.

Hence, (3+5) x = 8x

Step 3: The answer is already in the simplified form which is 8x.

To add monomials, you simply combine the coefficients (numbers in front of the variables) while keeping the variable part the same.

Subtracting Monomials:

1. Identify like terms, combine by subtracting coefficients.
2. Keeping variables and exponents constant.
3. Simplify by removing unnecessary coefficients or parentheses.

Given: $11xy^2 - (-5xy^2)$

Step 1: The given are example of like terms having a same variables of x raised to a power of 1 and y raised.

- To Subtract these, we'll subtract the coefficients.

  11- (-5)

- Since the subtrahend is -5, it will change into positive and then will be add to the minuend which is 11. *(Law of subtracting integers is applied).*
- Hence, 11+ 5= 16

Step 2: Keep the variables and exponents the same.

$$16xy^2$$

Step 3: The answer is already in the simplified form.

When subtracting monomials, you subtract the coefficients while keeping the variable part unchanged, simplifying the expression by combining like terms.