CHAPTER-19

FUNDAMENTAL OPERATIONS

STUDY NOTE

In Mathematics, the operations addition (+), subtraction (-), multiplication (x) and division (/) are the four fundamental operations.

Like Terms

Like Terms are **terms** whose variables (and their exponents such as the 2 in x^2) are the same.

In other words, terms that are "like" each other.

Note: the **coefficients** (the numbers you multiply by, such as "5" in 5x) can be different.

Example:

7x **x** **-2x** **πx**

are all **like terms** because the variables are all **x**

Example:

$(1/3)\mathbf{xy^2}$ $\mathbf{-2xy^2}$ $\mathbf{6xy^2}$ $\mathbf{xy^2/2}$

are all **like terms** because the variables are all $\mathbf{xy^2}$

- (i) ADDITION OF LIKE TERMS:

- The addition of like terms is a single term (like to the given terms) whose coefficient is equal to the sum of the coefficients of the given (like) terms.

For example: 1. 2xy + 5xy= 7xy

2. 3x + 9x = 12x

- (ii) ADDITION OF UNLIKE TERMS:

- As shown above, the sum of two or more like terms is a single like term, but two unlike terms cannot be added together to get a single term.

- For example: the unlike terms 2ab and 4bc cannot be added together to form a
- single term. All that can be done is to connect them by the sign of addition and leave
- the result in the form 2ab + 4bc.

Example: These are NOT **like terms because the variables and/or their exponents are different:**

$2x$ $2x^2$ $2y$ $2xy$

- (i) SUBTRACTION OF LIKE TERMS:

- The subtraction of like terms is a single term (like to the given terms) whose coefficient is equal to the difference of the coefficients of the given (like) terms.

For example: 1. 12xy - 5xy= 7xy

2. 23x - 9x = 14x

Adding Polynomials

Two Steps:

- Place **like terms** together
- Add the like terms

Example: Add **$2x^2 + 6x + 5$** and **$3x^2 - 2x - 1$**

Start with: $2x^2 + 6x + 5 + 3x^2 - 2x - 1$

Place like terms together: $2x^2+3x^2 + 6x-2x + 5-1$

Which is: $(2+3)x^2 + (6-2)x + (5-1)$

Add the like terms: $5x^2 + 4x + 4$

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