5
Chapter

Algebraic Expressions

We'll cover the following key points:

→ Degree of an algebraic expression
→ Addition of algebraic expressions
→ Subtraction of algebraic expressions

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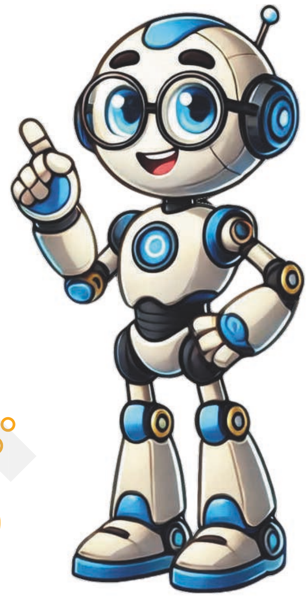

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Learning Outcomes

By the end of this chapter, students will be able to:

- Define algebraic expressions and identify their components, including variables, constants, and coefficients.
- Simplify algebraic expressions by combining like terms and applying the distributive property.
- Perform operations (addition, subtraction, multiplication, division) on algebraic expressions, following the correct order of operations.
- Expand algebraic expressions by using the distributive property to multiply expressions with parentheses.
- Factorize simple algebraic expressions by finding the common factors of terms and grouping terms appropriately.
- Evaluate algebraic expressions by substituting numerical values for variables and simplifying the resulting expressions.
- Understand the concept of terms and factors in algebraic expressions and identify the degree of terms and polynomials.
- Compare and order algebraic expressions based on their degree, terms, and coefficients.
- Translate word problems into algebraic expressions and solve real-life problems using algebraic expressions.
- Apply algebraic expressions in solving equations and inequalities, and understand their role in representing relationships and unknown quantities.

Mind Map

ALGEBRAIC EXPRESSIONS

Formation of expressions

i. The expression x^2 is obtained by multiplying the variable x by itself.

$x \times x = x^2$

ii. The expression $2y^2$ is obtained from y :

$2y^2 = 2 \times y \times y$

Coefficients

➢ **Term ⇒ $10xy^2$**

- 10 is Coefficient of xy^2.
- x is Coefficient of $10y^2$.
- $10y^2$ is Coefficient of x.

Monomials, Binomials, Trinomials and Polynomials

i. One term in expression – Monomials.

e.g., 4x, $5x^2y$ etc.

ii. Two terms in expression – Binomials.

e.g., 3x + 4y

iii. Three terms in expression – Trinomials.

e.g., $3x + 4y + y^2$

iv. One or more terms in expression - Polynomials

Terms of an expression

- Term are added to form expressions.

$4x^2 - 3xy$ consists of two terms $4x^2$ and $-3xy$. The terms $4x^2$ is a product of 4, x and x ; 4, x and x are **Factors** of the term $4x^2$.

Like and unlike terms

➢ Same algebraic factors – like terms, different algebraic factors – unlike terms.

e.g.,

- 4xy, 8xy like terms
- 4xy, $8x^2y$ unlike terms

Value of Expression

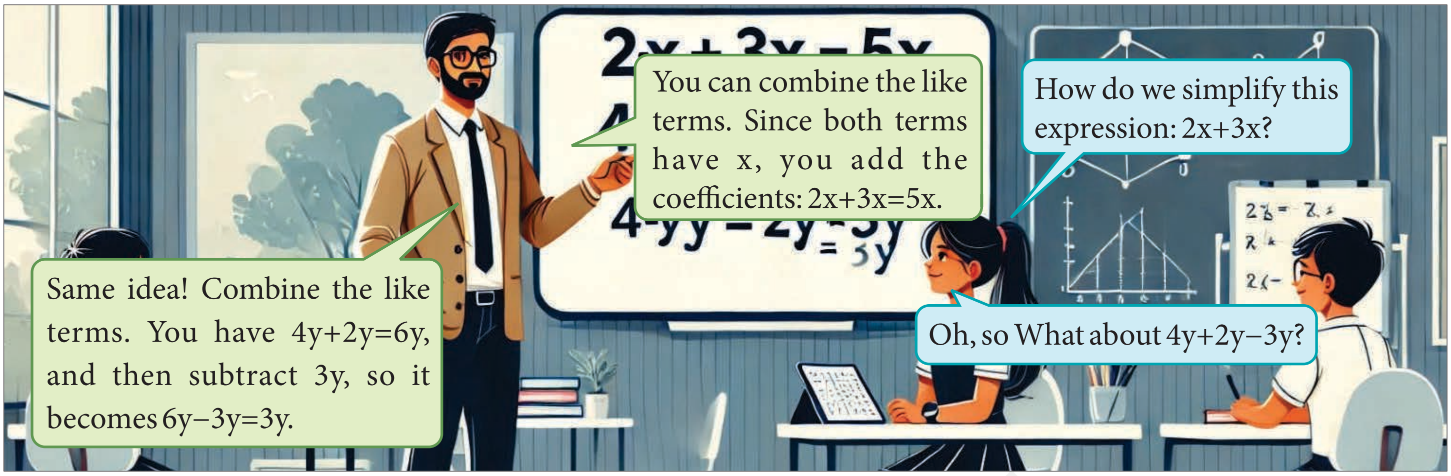
- **Expression**

$4x - 3$ value at x = 2

$4 \times 2 - 3 = 8 - 3 = 5$

Based on NCERT*

Introduction



Example : Let the cost of one notebook be ₹30. Two notebooks will cost ₹60 and three notebooks will cost ₹90, and so on. Now, make a table as given below.

Notebooks	1	2	3	4	5	6	7	8	9	10
Cost (in ₹)	30	60	90	120	150	180	210	240	270	300

We can easily find out the cost for 10 notebooks from the above table.

Observe the table carefully :

For 1 notebook, the cost is $30 \times 1 =$ ₹30

For 2 notebooks, the cost is $30 \times 2 =$ ₹60

For 3 notebooks, the cost is $30 \times 3 =$ ₹90

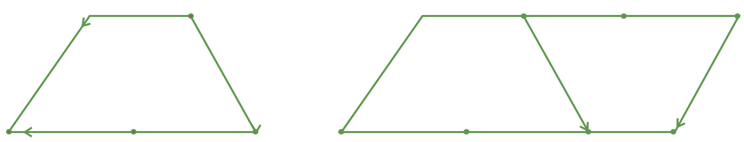
For 4 notebooks, the cost is $30 \times 4 =$ ₹120

For 10 notebooks, the cost is $30 \times 10 =$ ₹300

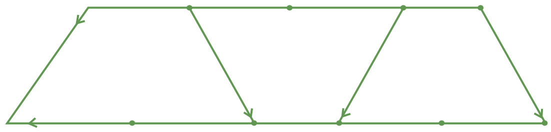
Similarly,

for x notebooks, the cost is $30 \times x =$ ₹$30x$

'Cost of x notebooks = ₹$30x$' is the generalisation of finding the cost of any number of notebooks. Whatever may be the number of notebooks, substitute x with that number to get the cost of that many notebooks. How are expressions formed. Similarly, let's make one pattern with matchsticks as given here.



(*i*) (*ii*)



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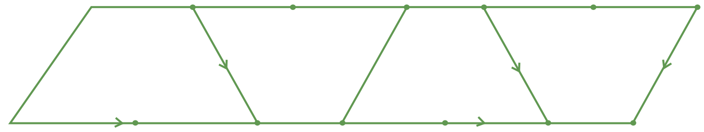

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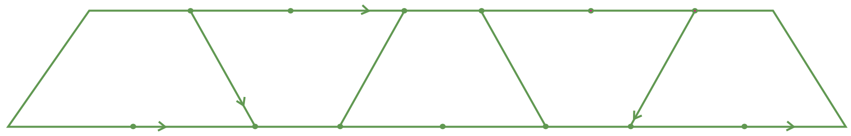

(v)

Let the number of trapeziums be x and the number of matchsticks be y.

Number of trapeziums [x]	1	2	3	4	5	6
Number of matchsticks [y]	5	9	13	17	21	25

Observe the table carefully, and you will find a pattern :

In 1 trapezium, the number of matchsticks $= 5 \times 1 - 0 = 5$

In 2 trapeziums, the number of matchsticks $= 5 \times 2 - 1 = 9$

In 3 trapeziums, the number of matchsticks $= 5 \times 3 - 2 = 13$

In 4 trapeziums, the number of matchsticks $= 5 \times 4 - 3 = 17$

In x trapeziums, the number of matchsticks $= 5x - (x-1) = 4x + 1$

Now $4x + 1$ is the generalisation of finding the number of matchsticks used in any number of trapeziums.

In an expression there are two main components–one is variable and other is constant. A variable has various values while a constant has fix value. We combine variable and constants to make algebraic expression. For this we use the operation of addition, subtraction, multiplication and division.

Look how the following expressions are obtained : x^2, y^2, $2xy + 7$

(i) The expression x^2 is obtained by multiplying the variable x by itself :

$$x \times x = x^2$$

As we write, $6 \times 6 = 6^2$, we write $x \times x = x^2$.

(ii) The expression $4y^2$ is obtained from y : $4y^2 = 4 \times y \times y$.

(iii) In $2xy + 7$, we first obtain xy multiply by 2 to get $2xy$ and then add 7 to $2xy$ to get the expression.

From the statements like, '$30x$' and '$4x+1$' are all **algebraic expressions**. Hence, an algebraic expression is an expression in which variables and constants are combined with the sign of fundamental operations [+, –, ×, ÷].

$3x^2 + 5x + 6$ is an algebraic expression. In this expression, $3x^2$, $5x$, and 6 are called **terms** of the expression. Each term of an algebraic expression is separated by the sign [+] or [–].

A term could be :

(*i*) a **constant** [like 6, 7, 10, etc.]

(*ii*) a **variable** or **unknown** [like $x, y, z, ...$]

(*iii*) a product of a constant and an unknown number [like $6xy$, $7xy$, $7x^2$]

(*iv*) a product of two or more unknown numbers [like x^2, x^2y, ab^2c]

Examples:

(*i*) $4x^2 + 3x + 4$ is an algebraic expression. Its terms are $4x^2$, $3x$ and 4.

(*ii*) $a^2 - 2a + 6$ is an algebraic expression. Its terms are $3a^2$, $(-2a)$ and 6.

Now, fill in the following table:

S.No.	Expressions	Constant	Coefficient	No. of terms	Highest power of variable
1.	$17x^2 - 6x + 4$				
2.	$-x^2 + 7x + 8$				
3.	$-6a^2 + 18ab + 9$				
4.	$-4x^2 + 9y^2 + 3$				

Take a Task

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Types of Algebraic Expression

Depending on the number of terms, algebraic expressions are classified as follows :

Monomial : An algebraic expression that contains one term is called a monomial.

Examples : $30x$, 5, $7xy$

Binomial : An algebraic expression that contains two terms is called a binomial.

Examples : $2x + 3$, $x^2 + y^2$, $6x + 9$

Trinomial : An algebraic expression that contains three terms is called a trinomial.

Examples: $3x^2 + 5xy + 2y^2, x^3 + 3x^2y + y^3$.

Polynomial : An algebraic expression that contains 2 or more than 2 terms is called a polynomial.

Examples: $x^2 + y^2 + 2xy + 7, x^3 - y^3 + 3xy^2 - 3x^2y$

Take a Task

Watch Remedial

Constant, Coefficient, and Powers

To understand constant, coefficient, and power, consider an expression, say, $[-8a^2 + 14a + 4]$. It has three terms $-8a^2$, $14a$, and 4. In the term $[-8a^2]$, $[-8]$ is the numerical which is multiplied to the variable a^2. It is called the coefficient of a^2 and here the power of a is 2. In $14a$, the coefficient is 14 and the power of the variable a is 1. The third term 4 does not have any variables multiplied to it and is called the constant term.

Example 1 : Write the coefficient of x in each of the following :

$(a)\ -6x$ $(b)\ 5x$ $(c)\ \frac{-5}{3}ax + 7$ $(d)\ +7ax$

Solution : (a) Coefficient of x in $(-6x)$ is -6 (b) Coefficient of x in $5x$ is 5

(c) Coefficient of x in $\frac{-5}{3}ax + 7$ is $\frac{-5}{3}a$ (d) Coefficient of x in $+7ax$ is $7a$

Hence, in a term of an algebraic expression, any of the factors along with the sign of the term is called the coefficient of remaining factors.

Like and Unlike Terms

Like terms: All the terms containing the same literal numbers (or variables) with the same degrees are called like terms.

Examples: (i) $x, 3x, 8x$ are all like terms because they have the same variable x.

(ii) $3x^2y, -6x^2y$ are all like terms because they have the same variable x^2y.

Unlike terms : Terms which have different variable parts are called unlike terms.

Examples: (i) $3x, 3y$ are unlike terms. (ii) $5xy, 7x, 8y$ are unlike terms.

Degree of an Algebraic Expression

The degree of an algebraic expression depends upon the power of variables present in it. Algebraic expression can be in one variable or two variables or more.

Take a Task

Watch Remedial

(*i*) Consider one variable x.

Let us take an algebraic expression $5x^3 + 6x + 8$.

It has three terms i.e., $5x^3$, $6x$ and $+ 8$.

In term $5x^3$, the power of variable x is **3**.

Hence, the degree of $5x^3$ is **3**.

In term $6x$, the power of variable x is 1.

Hence, the degree of $6x$ is 1.

The term (+8) has no variable. So, the power of variable in it is 0.

Hence, the degree of 8 is 0.

Thus we can conclude that the degree of an algebraic expression is the higest power of variable in that expression.

(*ii*) Consider two variables, x and y.

To find out the degree of an algebraic expression in two variables, consider a polynomial, say $x^3 y^2 + 3xy^2 + 5xy + 8$.

In the term $x^3 y^2$, the degree is considered as 5. When the variable are multiplied, the powers are added to decide the degree of the term. The $3xy^2$ has degree 3 and $5xy$ has degree 2 and 8 has zero degrees. The highest power of variables in the given expression is 5. Hence, the degree of expression $x^3y^2 + 3xy^2 + 5xy + 8$ is 5.

Example 2 : Find the degree of the following polynomials:

(*i*) $4x^2 + 1 + 4x^4 - 3x^3$ (*ii*) $5a^3 + 4a^2 - 7a + 5$

(*iii*) $3x^2y^2 - 5xy^3 - 5xy^4 + 3x^2y^3z^2$

Solution : First write the polynomials in descending order of powers of their terms:

(*i*) $4x^4 - 3x^3 + 4x^2 + 1$. The degree is 4.

(*ii*) $5a^3 + 4a^2 - 7a + 5$. The degree is 3.

(*iii*) $3x^2y^3z^2 - 5xy^4 + 3x^2y^2 - 5xy^3$. The degree is 7.

Example 3 : Find the value of $x^2 + 2ax + a^2$, if $x = 2$ and $a = 3$.

Solution : Substitute $x = 2$ and $a = 3$ in the expression :

$$x^2 + 2ax + a^2 = (2)^2 + 2 \times (3) \times (2) + (3)^2 = 4 + 12 + 9 = 25$$

Exercise 5.1

1. Write the numerical coefficient of each term :

(i) $-8y^2$ (ii) $\frac{5}{3}ab^2$ (iii) $-2x^2y$ (iv) $\frac{-15}{8}a^2b^3$

(v) $5xyz^2$ (vi) $-3x^2z^2y^3$ (vii) $\frac{-3}{8}a^2b^2$ (viii) $\frac{-3}{25}a^2xy^2$

2. Write the constant term of each of the following algebraic expressions :

(i) $8x + 3$ (ii) $2x^2 - 7y^2$ (iii) $8x - 7y + 6z$ (iv) $3x^2 - 1 + 2x$

(v) $4y^3 - 3y + 5$ (vi) $7 - 2x^2 + 5y^2$ (vii) $5x^2 + 6x - 9$ (viii) $2a^4 - 3a^2 + 5a - a^3 - 1$

3. Write all the terms of each of the following algebraic expressions :

(i) $3x + 5$ (ii) $2x^2 + y$ (iii) $3x$ (iv) $2x^2 + y^3 - xyz$

(v) $2a^3 + 2b^3 - 8ab + 7$ (vi) $3a^2b + 2ab^2$ (vii) $4ab^2 + 2a^3b$ (viii) $3x^2y + 5xy^2 + 135x^3y^3$

4. Pick out the like terms from each group :

(i) $5x, 6y, 7x$ (ii) $2a, 7b, -6b$ (iii) $5x^2, 8yz, 8x^2$

(iv) $xy, 3x^2y, -y^2, -7yx^2$ (v) $2xy, yz, 3x, 6yz$ (vi) $ab, a^2b, a^2b^2, 7a^2b$

5. Identify the algebraic expressions as monomial, binomial, trinomial or polynomial:

(i) $x + y - z - 7$ (ii) $7xy - 3x$ (iii) $c^2 - 2a^2$

(iv) $2a^2b + 3ab^2 - 4ba^2$ (v) $-8xy^2 + 6xy + 3x^2y$ (vi) $2abc + 3a^2bc - 8a^2b^2c^2$

6. Write down the degree of the following algebraic expressions :

(i) $2y^2 + y^2z^2$ (ii) $1^1y + 5$ (iii) $3x^2yz + 2xy$

(iv) $2x^3 - 9x^2y^2 + 6x^3y^3 - 7$ (v) $-8a^4 - 7a^3 + 8a$ (vi) $x^2 - 6x^2yz^2$

Addition of Algebraic Expressions

The basic principle of addition is that we can add like terms only. Unlike terms cannot be added. So, to add two or more algebraic expressions, we collect different groups of like terms and add the coefficients of the like terms in each group. To do so, we can follow two methods:

(*i*) Horizontal method (*ii*) Column method

Horizontal method : In this method of addition, we arrange all the terms in a horizontal line and then we add by combining the like terms.

Example 4 : Find the sum of $10x$, $5x$, $-4x$, and $3x$.

Solution : $10x + 5x - 4x + 3x = 14x$

Example 5 : Add $(3x + 7y)$, $(6x - 3y + 6)$ and $(-5x + 2y + 7)$.

Solution : $(3x + 7y) + (6x - 3y + 6) + (-5x + 2y + 7)$

$= (3x + 6x - 5x) + (7y - 3y + 2y) + (6 + 7) = 4x + 6y + 13$

Example 6 : Add $(4x^2 - 5xy + 3y^2)$, $(-6x^2 - 4xy + 2y^2)$, and $(-3x^2 - 2xy - 4y^2)$.

Solution : $(4x^2 - 5xy + 3y^2) + (-6x^2 - 4xy + 2y^2) + (-3x^2 - 2xy - 4y^2)$

$= (4x^2 - 6x^2 - 3x^2) + (-5xy - 4xy - 2xy) + (3y^2 + 2y^2 - 4y^2)$

$= (4 - 6 - 3)x^2 + (-5 - 4 - 2)xy + (3 + 2 - 4)y^2 = -5x^2 - 11xy + y^2$

Column method : In this method, we write the like terms in columns and then add them.

Example 7 : Add $(6a + b)$, $(5a - 2b)$, and $(-3a - b + c)$.

Solution :

$$\begin{array}{rrr} 6a & + b & \\ 5a & - 2b & \\ -3a & - b & + c \\ \hline 8a & - 2b & + c \\ \hline \end{array}$$

Take a Task

Watch Remedial

Example 8 : Add $(4x^2 - 5xy + 3y^2)$, $(-6x^2 - 4xy + 2y^2)$, and $(-3x^2 - 2xy - 4y^2)$.

Solution :

$$\begin{array}{rrr} 4x^2 & - 5xy & + 3y^2 \\ -6x^2 & - 4xy & + 2y^2 \\ -3x^2 & - 2xy & - 4y^2 \\ \hline -5x^2 & -11xy & + y^2 \\ \hline \end{array}$$

Example 9: If $P = x + y + z$ and $Q = 2x - y + 3z$, find $P + 2Q$.

Solution: $2Q = 2 \times (2x - y + 3z) = 4x - 2y + 6z$

Now, $P + 2Q = (x + y + z) + (4x - 2y + 6z)$

$$\begin{array}{r} x + y + z \\ 4x - 2y + 6z \\ \hline 5x - y + 7z \end{array}$$

Hence, $P + 2Q = 5x - y + 7z$.

Subtraction of Algebraic Expressions

Like addition, subtraction is also possible between two like terms only. When we subtract a number from another number, we add the additive inverse of the second number to the earlier number.

Example : Subtract 2 from 6.

We change the sign of 2 to negative (additive inverse) and write as 6 – 2 = 4.

Subtraction can be done either in columns or horizontally by combining the like terms after changing the signs of the terms to be subtracted.

Example 10 : Subtract $5a - 3b$ from $-8a + 7b$.

Solution : $(-8a + 7b) - (5a - 3b) = (-8a + 7b) + (-5a + 3b)$

$= (-8a - 5a) + (7b + 3b)$

$= -13a + 10b$

Example 11 : Subtract $(a^3 + b^3 - 3ab)$ from $(a^3 - b^3 - 3ab)$.

Solution : Column method

$$\begin{array}{rrrl} a^3 & - b^3 & - 3ab & \\ a^3 & + b^3 & - 3ab & \\ - & - & + & \text{(change of sign)} \\ \hline 0 & -2b^3 & + 0 & = -2b^3 \end{array}$$

Example 12 : Subtract $(x^2 - 3xy + 7y^2 - 2)$ from $(6xy - 4x^2 - y^2 + 5)$.

Solution : Column method

$$\begin{array}{rcrcrcr} +6xy & - & 4x^2 & - & y^2 & + & 5 \\ -3xy & + & x^2 & + & 7y^2 & - & 2 \\ + & & - & & - & & + \\ \hline 9xy & - & 5x^2 & - & 8y^2 & + & 7 \\ \hline \end{array}$$

Exercise 5.2

1. **Pick the like terms from each group and add them :**

   (*i*) $3a, 5b, 7b, 9a^2$ (*ii*) $2y^2, z^2, -7y^2, x^2$ (*iii*) $3p^2q, 4qp^2, 5pq^2, 9pq$

   (*iv*) $2xy^2, 2y^2x, 3x^2y^2$ (*v*) $4xy, -5x^2y, -3xy, 2xy^2$ (*vi*) $5abc^2, 8bc^2, -4abc^2$

2. **Simplify :**

   (*i*) $7a - 4a$ (*ii*) $2x + 9x$ (*iii*) $-7m + 15m$

   (*iv*) $12p + (-3q)$ (*v*) $2x^2 - 3y^2 + 4x^2 - 5y^2$ (*vi*) $5x + 4y - 6x - 3y$

   (*vii*) $8k - 8k - 8k + k^2$ (*viii*) $16y - 13y^2 - 27y + 3y^2$

3. **Subtract :**

   (*i*) $(4a + 3b)$ from $(2b + 2a)$ (*ii*) $(x^2 - y^2)$ from $(2x^2 - 3y^2)$

   (*iii*) $(10a^2 - 5a)$ from $(-10a - 6a^2)$ (*iv*) $(3xy - 4)$ from $(xy + 11)$

4. **Add the following terms using horizontal method :**

   (*i*) $3x^2, 4x^2, -7x^2$ (*ii*) $x^2y^2, -5x^2y^2, -6x^2y^2$

   (*iii*) $7ab, 8ab, -10\,ab, -2ab$ (*iv*) $a + b, 2a - b, -a + b$

5. **Subtract :**

   (*i*) $(-3x^2 + 6x + 3)$ from $(5x^2 - 9)$ (*ii*) $(3x\text{-}4z)$ from $(7x + 8y + 9z)$

   (*iii*) $(1 - x^2 - y^2)$ from $(xy + y^2 - x^2 + 1)$ (*iv*) $(4x^3 - 7x^2 + 5x - 4)$ from $(6 - 5x + 6x^2 - 8x^3)$

   (*v*) $x^3 + 3x^2y + 6xy^2 - y^2$ from $y^2 - 5xy^2 - 4x^2y$

6. **Find the sum of the following using the column method :**

(i) $2a^2 + 12ab + b^2, a^2 - 22ab - b^2, 2a^2 + 3b^2$

(ii) $2x^3 - 5x^2 + 7, -9 - 2x^3$

(iii) $16a - 5b + c, -2a + 4b - 2c, b - c$

(iv) $5x^3 + 7 + 6x - 5x^2, 2x^2 - 28 - 19x, 2x - 12x^2 + 13x^3, 8x^3 - 8x - x^2$

7. If $P = 16x^3 - 18x^2 + 14x - 12$ and $Q = 25 - 24x + 16x^2 - 28x^3$, find $2P + 3Q$.

8. If $A = 3x^2 - 6x + 5, B = -2x^2 - 7x + 6$ and $C = 7x^2 - 18x + 8$ find $2A + 5B + 3C$.

9. Find the value of $P - Q + 8$, if $P = (x^2 + 7x)$ and $Q = (-x^2 - 3x + 2)$.

10. If $A = 5x^2 + 7x + 8$ and $B = 4x^2 - 7x + 3$, find $2A - B$.

HOTS (Higher Order Thinking Skills)

Critical Thinking

1. How much larger is $13x^2 - 7y^2$ than $6x^2 - 9y^2$?
2. How much does $9a^2 + 7a - 2$ exceed $2a^3 + 4a^2 + 3a + 1$?
3. A rope is $3a + 6$ metres long and is attached to another rope of length $2a - 7$ metres. Find the total length of the rope.

Chapter-end Exercise

Gap Analyzer™

A. Tick (✓) the correct option.

1. The terms of the expression $3x^2y - 5xy + 7x^2y^2 - 7$ are __________ .

(a) $3x^2y, 5xy, 7x^2y^2$ ☐ (b) $3x^2y, -5xy, 7x^2y^2$ ☐

(c) $3x^2y, -5xy, 7x^2y^2, -7$ ☐ (d) none ☐

2. The numeral coefficients of each term of the algebraic expression $2x^2 - 7x^2y + 5xy^2 - 8$ are __________ .

(a) 2,7,5,8 ☐ (b) 2, –2, 5, 8 ☐ (c) 2,–7,–5,–8 ☐ (d) 2, –7, 5, –8 ☐

3. Simplify by combining the like terms of $(3y^2 + 5y - 4) - (8y - y^2 - 4)$.

(a) $4y^2 - 3y$ ☐ (b) $2y^2 - 3y$ ☐ (c) $4y^2 + 3y$ ☐ (d) none ☐

B. Fill in the blanks:

1. The degree of a constant term is __________.
2. An algebraic expression with more than three terms is called a __________.
3. A symbol having a fixed numerical value is called __________.
4. The sum of two like terms is another __________ term.
5. A letter used to represent a number is called __________.

C. Answer the following questions:

1. Write the numerical coefficient of each term of the following :

(i) $3a + 4ab - 2b$ (ii) $2m^2 + n^2 - 3mn + 4$

(iii) $-2x^3 + 7xy - 6xy + 8$ (iv) $x^2 - 3xy + 7y - 2$

2. Write down the coefficients of the following :

(i) b^2 in $(5ab^2)$ (ii) p in $-2px$ (iii) z in $(-z)$

(iv) x in $\frac{2}{5}xy^2$ (v) y^2 in $18x^2y^2$ (vi) y in $(-4x^2y)$

3. Add the following :

(i) $3ab, -7ab, 3ab, -12ab$ (ii) $3x^2 - 5x + 6, 2x^3 + 4x - 7$

(iii) $3a + 4b + 5c, 6a - 3b - 7c, -3a + 2b + 3c$ (iv) $x^3 + y^3 + 3x^2y + 3xy^2, 3x^3 - 2y^3 - 3xy^2$

4. Subtract the following:

(i) $7ab$ from $5ab$ (ii) $-3a$ from $5a$

(iii) x^3 from y^3 (iv) $3a^2b$ from $-7a^2b$

5. Subtract :

(i) $6x + 4y$ from $2x + 3y$ (ii) $-9x - 7y$ from $-6x - 3y$

(iii) $x^3 + y^3$ from $x^3 - y^3$ (iv) $16x + 12y$ from $16x - 30y$

(v) $-(x + y + z)$ from $(x + y + z)$ (vi) $x^3 + y^3 - 3xy$ from $y^3 + 3xy + z^3$

6. Subtract $(9x^3 + 4x^2 + 2x - 7)$ from zero.

7. The side of a square is $7x + 5$ metres. Find its perimeter.

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Mental Maths

Problem Solving

1. One side of an equilateral triangle is $3a + 4b$ metres. Find its perimeter.
2. How much does $9x^2 + 7x - 2$ exceed $4x^2 + 3x + 1$?
3. From the sum of $4a^2 - 6a + 3$ and $-4a^2 - 7a + 5$, subtract $3a^2 - 8a + 6$.
4. The sum of two expressions is $a^2 - b^2 + 3b - 5$. If one of them is $2b^2 + 2a^2 - 10$, find the other.

Assertion and Reason

Experiential Learning

In each of the following questions, an Assertion (A) and a corresponding Reason (R) supporting it is given.

Study both the statements and state which of the following is correct:

(*a*) Both A and R are true and R is the correct explanation of A.

(*b*) Both A and R are true but R is not the correct explanation of A.

(*c*) A is true but R is false.

(*d*) A is false but R is true.

1. **Assertion (A) :** $2x$, $5x^2y$ and $2/3\ ab^2c^3$ are examples of monomials.

   Reason (R) : An algebraic expression containing only one term is called a monomial.

2. **Assertion (A) :** A term of the algebraic expression having no literal factor is called a constant term.

   Reason (R) : In $-9xyp^3$, -9 is the constant term.

3. **Assertion (A) :** $(7x + 3) - (3x - 5)$ is equal to $4x + 8$.

   Reason (R) : $(4x + 3y) - (2x - 4y)$ is equal to $2x - 7y$.

4. **Assertion (A) :** $x + 3$, $a^2 - 2abc$, $5 - 2x$ etc., are example of binomials.

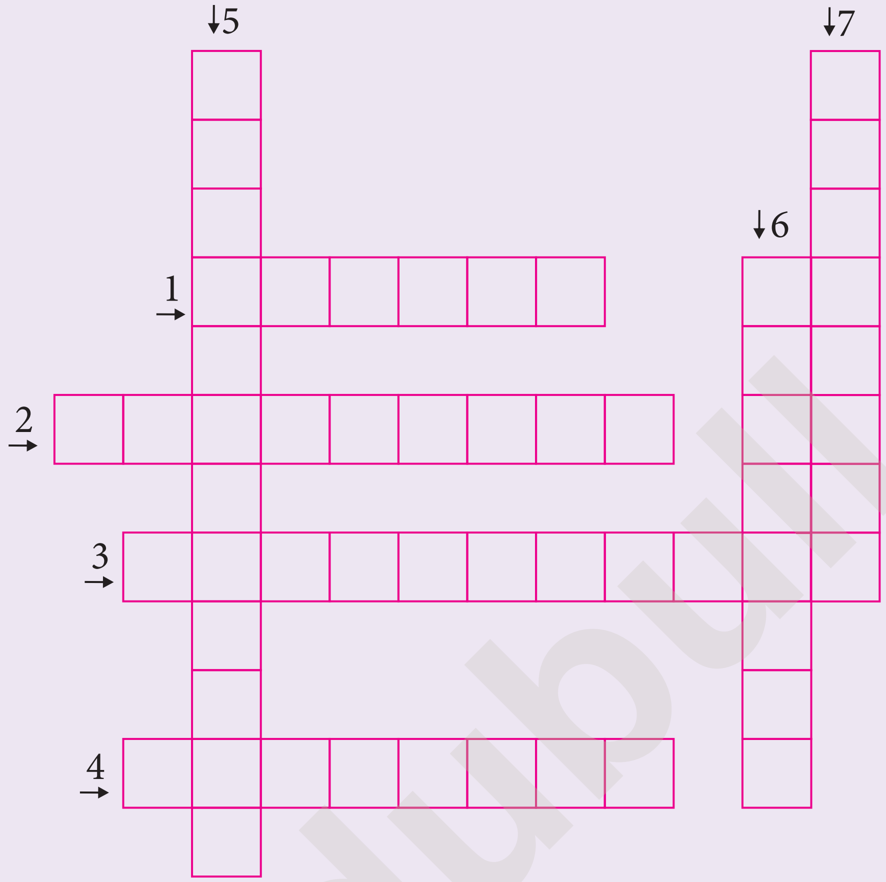
   Reason (R) : An algebraic expression containing two terms is called a binomial.

5. **Assertion (A) :** A symbol with fixed numerical value is called a constant.

   Reason (R) : In a^3, a is called exponent and 3 is called base.

Puzzle

Solve the given crossword with the help of clues given below :



Across (→)

1. In a algebraic expression, the highest power of a particular term is the of the polynomial.
2. An algebraic expression containing three terms is called a ______________.
3. The number expressed in symbols placed before an algebraic term as a multiplier is called its ______________ .
4. A symbol which can be take various numerical values is called ______________ .

Down (↓)

5. An algebraic expression containing four terms is called ______________ .
6. In a^5, a is called base and 5 is called ______________ .
7. A symbol with fixed numerical value is called ______________ .