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Chapter - 6

Algebraic Expressions

- Algebraic Expressions: - An algebraic expression, as you know, is made up of variables and constants, which are connected by the operations of addition, subtraction, multiplication, and division.

Exercise - 6.1

- Q-1 For the given algebraic expression $(2ab)(3ac) - (6c^2)(ca) + (2ab) - (ac)$, complete the following table, filling in the required coefficients. Write NA for the coefficients that do not apply.

Term	Coefficient of a	Coefficient of b	Coefficient of c	Coefficient of a^2
$(2ab)(3ac)$	$6abc$	$6a^2c$	$6a^2b$	$6bc$
$-(6c^2)(ca)$	$-6c^3$	NA	$-6ac^2$	NA
$(2ab) - (ac)$	$-2abc$	$-2a^2c$	$-2a^2b$	$-2bc$

Term	Coefficient of c^3	Coefficient of bc
$(2ab)(3ac)$	NA	$6a^2$
$-(6c^2)(ca)$	$-6a$	NA
$(2ab) - (ac)$	NA	$-2a^2$

- Ques 2 Identify which of the following pairs contain like terms or unlike terms.

$$\begin{aligned} &= 3ab + 6bc - 4ca \text{ and } 2ab - 2bc + 3ca \\ &= 3ab + 6bc - 4ca + 2ab - 2bc + 3ca \\ &= 3ab + 6bc - 4ca \end{aligned}$$

$$= 3ab + 6bc - 4ca +$$

$$2ab - 2bc + 3ca$$

$$5ab + 4bc - 6a \quad \text{express}$$

$$2ab - 2bc + 3ca$$

$$5ab + 4bc - ca \text{ approx}$$

$$\begin{aligned} &= 5ab^2 - 5bc + 8ca \text{ and } 3ab^2 + 6bc - 4ca \\ &= 5ab^2 - 5bc + 8ca + 3ab^2 + 6bc - 4ca \\ &= 5ab^2 - 5bc + 8ca \end{aligned}$$

$$= 5ab^2 - 5bc + 8a + 3ab^2 + 6bc - 9a$$

Sub 2 - Sub 4 & ca

$$3ab^2 + 6bc - 4c$$

$$-8ab^2 + bc + 49a \text{ and}$$

Q2. Sold the following:

(a) $5a + 2a^2 - 3a^3 + 8$; $-4a^2 + 5a^3 - 9$; $-2a$
 $6a^2 - 3a^3$; $-a + 4a^2 - 9$; $4 - a - 2a^2 + 3a^3$

$$5a + 2a^2 - 3a^3 + 8; -4a^2 + 5a^3 - 9; -2a^4a^2 - 3a^3; -a + 4a^2 - 9; 4 - a - 2a^2 + 3a^3$$

$$= a + 6a^2 - 2a^3 - 6 \text{, thus}$$

$$\begin{aligned} & -2a + 5a^2 - a^3 + 2i; 5a^2 - 2a^3 + 4; a - a^2 \\ & + 3a^3; -2a - 3a^2 - 4; 6 - 3a + 2a^2 - 2a^3 \\ & - 6a - 2a^2 - 2a^3 + 8 \end{aligned}$$

$$-2a + 5a^2 - a^3 + 2i; 5a^2 - 2a^3 + 4; a - a^3 + 3a^3; -2a - 3a^2 - 4; 6 - 3a + 2a^2 - 2a^3$$

$$= -6a - 2a^2 - 2a^3 + 0$$

Q-3 Subtract -

$$\begin{aligned} \Rightarrow 2x^2 - 5xy + 3y^2 + 5 & \text{ from } 4x^2 + 3xy - 5y^2 + 9 \\ \Rightarrow 2x^2 - 5xy + 3y^2 + 5 - 4x^2 + 3xy - 5y^2 + 9 \\ \Rightarrow -2x^2 + 3y^2 + 3xy - 5y^2 + 9 \end{aligned}$$

$$\Rightarrow 2x^2 - 5xy + 3y^2 + 5 \text{ where } 4x^2 + 3xy - 5y^2 + 9$$

$$4x^2 + 32x - 54x^2 + 9$$

2x2 - 5x + 6x^2 + 10

$$+ 2 - 2 = 0$$

$$\begin{aligned} & \textcircled{b} \quad 5a^2 + 7ab - 2b^2 + 4 \sqrt{} \quad 7a^2 - ab + 2b^2 \\ & \quad 5a^2 + 7ab - 2b^2 + 4 \sqrt{} \quad 7a^2 - ab + 2b^2 \\ & \quad \quad 7a^2 - ab + 2b^2 \end{aligned}$$

$$\Rightarrow 5a^2 + 7ab - 2b^2 + 4 \quad 7a^2 - ab + 2$$

$$\Rightarrow 7a^2 - 9b + 2b^2$$

$$S_{a^2}^2 + 7ab - 2b^2 + 4$$

$$2a^2 + 8ab + 4b^2 - 4$$

9-4

How much does $3x^2 - 14xy + 8y^2$ exceed $x^2 + 3xy + 4y^2 - 2xy^2$?

$$= 3x^2 - 14xy + 8y^2 - x^2 + 3xy + 4y^2 - 2xy^2$$

$$x^2 + 3xy + 4y^2 + 2xy^2$$

$$2x^2 - 7xy + 4y^2 + 2xy^2$$

Ques What should be substituted from $4a^3 + 2a^2b - 4ab^2$ to get $2a^3 + 3a^2b$?

$$= 4a^3 + 2a^2b - 4ab^2 - 2a^3 + 3a^2b$$

$$-2a^3 + 3a^2b$$

$$2a^3 - a^2b - 4ab^2$$

$$2a^3 - a^2b - 4ab^2$$

Q6 What should be added to $-3a^2b^2c + 2abc^2$ to get $7a^2b^2c + 11ab^2c - 7$

$$= -3a^2b^2c + 2abc^2 + 18 - 1a^2b^2c + 11ab^2c$$

$$-3a^2b^2c + 2abc^2 + 18$$

$$-7a^2b^2c + 11abc^2 + 2$$

~~$10abc^2 + 9abc^2 + 25$~~

Q-8 From the sum of $4x^2 + 3x - 1$ and $2x^2 + 2x + 4$ subtracted $3xy - 2y^2 + 5y - 6y$

$$\begin{aligned} \text{Sum} &= 4x^2 + 3x - 1 + 2x^2 + 2x + 4 \\ &= 6x^2 + 5x + 3 \end{aligned}$$

$$\begin{aligned} \text{Subtraction} &= 5xy + 4y - 2xy + 5 \\ &= 3xy + 4y - 1 \\ &= 3xy + 4y - 1 \end{aligned}$$

Q-9 Subtract $2x^2 - 3xy$ from the sum of $2x^2 - 3xy + 11xy$ and $4x^2 - 4x^2 + 9xy$

$$\begin{aligned} \text{Sum} &= 2x^2 - 3xy + 11xy + 4x^2 - 4x^2 + 9xy \\ &= 6x^2 + 8xy \end{aligned}$$

$$\begin{aligned} \text{Subtract} &= -3x^2 - 2y^2 + 20xy \\ &= -2x^2 - 3xy + 5x^2 - 2y^2 + 23xy \end{aligned}$$

Q-10 From the sum of $3x + 2x^2 - y$ and $6y - 5x + 3x^2 + 4x$, subtract the sum of $2x^2 - 2xy + 3x - 5y$ and $3x^2 + 2y^2 - 4x - y$

$$\begin{aligned} \text{Sum} &= 3x + 2x^2 - y + 6y - 5x + 3x^2 + 4x \\ &= 5x^2 + 2x + 5y \end{aligned}$$

$$\begin{aligned} \text{I Sum} &\Rightarrow 5x + 2x^2 - y + 6y - 5x + 3x^2 + 4x \\ &= 5x^2 + 2x + 5y \end{aligned}$$

$$\begin{aligned} \text{II Sum} &\Rightarrow x^2 - 2x^2 + 3x - 5y \\ &= -x^2 + 3x - 5y \end{aligned}$$

$$\begin{aligned} \text{Subtract} &\Rightarrow 7x + 5x^2 - 6y + 6y \\ &= -x + 4x^2 - 6y + 12y \end{aligned}$$

Ans $\Rightarrow 8x + 3x^2 - 6y + 12y$

Q-10 Write the given statements as an algebraic statements

"I have times the sum of $3x - 2y - 2(4x)$ and $3y - 4(3 - 5x)$ is added to $5x + 2(3 - y)$ "

$$\Rightarrow 5x + [3x - 2(2y - 2(1 - 4x))] + 3y - 4(3 - 5x)$$

Q-11 Simplify the following

$$(9) 4x - [3x - (1 - 5x) - 6(8 - 3(2x + 7)2)]$$

$$\Rightarrow 4x - [3x - (1 - 5x) - 6(8 - 3(2x + 7)2)]$$

$$\Rightarrow 4x - [3x - 1 + 5x - 6(8 - 3(2x + 7)2)]$$

$$\Rightarrow 4x - [3x - 1 + 5x - 6(8 - 6x - 212)]$$

$$\Rightarrow 4x - [3x - 1 + 5x - 48 + 36x + 126]$$

$$15 + 9(2-1) = 40 + 126]$$

$$\Rightarrow 7x - (3x + 5x + 126) = -1 - 48 + 126$$

$$4x - [44x - 49 + 126]$$

$$\Rightarrow x_1 x_2 - [y_1 y_2 + z_1 z_2]$$

$$4x - 44x - 77$$

$$-40x - 7 + 20x$$

6) $9x - 18 - (3 - 7x) - 3(5x - 3(4 - 2x))$

$$\Rightarrow 9x - [3 - 7x] - 3[5x - 3(4 - 2x)]$$

92-68-3742-3232
92-68-3742-3232-12+6232

$$9x - 60 - 3 + 7x - 26 = 0$$

$$9x - 17x - 15x - 18x + 0 - 3 + 36 = 7$$

$$9x - 33x + 8 - 3 + 36 =$$

$$9x - 5 - 26x + 8 - 3 + 38$$

$$9x - [-26x + 41]$$

$$92 + 26x - 91$$

Find the value of δ -

(a) $8x^3 + y^3 + 3xyz$ given that $x = -1, y = 2$,
and $z = 3$

$$\Rightarrow (-1)^3 + 2^3 + 3 \times (-1) \times 2 \times 3$$

(PT-101)-1

$$P \vdash T$$

$R + 6T =$

② -11.9m

(b) $3abc - ka^n + 4b^3 + ac$ given that $a = -2$

$$b = 3, \text{ and } c = -1$$

$$3x(-2) \times 3x(-1) - 2x(-2)^2 + 4 \times 3^2$$

$$2 + 201 + 8 - 87$$

$$18 + 108 + 2 - 8$$

7h0-8

260 1894

(c) $5a^2 - 3a + 4$ para $a = 3$

$$\Rightarrow 5x^2 - 3x + 4$$

$$45 - 9 + 4$$

29-9

40 cm

6a²b - 5ab² + 10ab - 7 given that a = t, b = r

$$\Rightarrow 6x^2 - 5x + 10 \quad x^2 - 7$$

$$\Rightarrow 1x - 20 + 20 - 7$$

$$\Rightarrow 1x + 20 - 20 - 7$$

32-20-1

32-27

5

9-13 Simplify and find the value of the simplified expression when $x = (-1)$ and $y = 2$.

(d) $3(x^2 - y^2) - (7xy + 3x^3 - 6y - 9xy)$

$$\Rightarrow 3(x^2x^2 - 4yx^2) - (7xy - 3x^3 - 6x^2 - 2xyx)$$

$$\Rightarrow 3x^2 - 3(2x^2 - 4xy + 2y^2) - (12xy - 3x^2 + 6y^2 + 2xy)$$

$$\Rightarrow 3(2x^2 - 4xy + 2y^2) - (12xy - 3x^2 + 6y^2 + 2xy)$$

$$\Rightarrow 6x^2 - 12xy + 6y^2 - 12xy + 3x^2 - 6y^2 - 2xy$$

$$\Rightarrow -12xy - 2xy + 3x^2 + 3x^2$$

$$\Rightarrow -18xy + 6x^2 + 3x^2$$

$$\Rightarrow \text{Value} \Rightarrow -18 \times 2^2 + 6 \times (-1)^2 - 9 \times (-1) \times 2$$

$$+ 3 \times (-1)^3$$

$$\Rightarrow -72 + 6 + 18 - 3$$

$$\Rightarrow -72 - 3 + 6 + 18$$

$$\Rightarrow -75 + 24$$

$$\Rightarrow -51 \text{ Ans}$$

$$\Rightarrow 4(x^2 + 3y^2) - 12xy - 5(2x^3 - 3y^2) + 10xy$$

$$\Rightarrow 4x^2 + 12y^2 - 12xy - 10x^3 + 15y^2 + 10xy$$

$$\Rightarrow 4x^2 + 12y^2 - 2xy - 10x^3 + 25y^2$$

$$\Rightarrow 4x^2 + 12y^2 - 2xy - 10x^3 + 25y^2$$

$$\Rightarrow \text{Value} \Rightarrow 4 \times (-3)^2 - 2 \times 2^2 - 8 \times (-1) \times 2 + 10$$

$$\times (-1)^3$$

$$\Rightarrow 4 - 12 + 16 - 10$$

$$\Rightarrow -12 - 10 + 16 + 16$$

$$\Rightarrow -22 + 20$$

$$\Rightarrow -2 \text{ Ans}$$

Q.14 Given the algebraic expression to give the number of line segments suggested to make the given patterns also, find.

Required algebraic expression = $4n - 5$

For segments required to make 10th pattern of the series = $4 \times 10 - 5$

Ans = 35

Ans = 35