

CBSE Class –VIII Mathematics

NCERT Solutions

CHAPTER - 9

Algebraic Expressions and Identities (Ex. 9.1)

1. Identify the terms, their coefficients for each of the following expressions:

(i) $5xyz^2 - 3zy$

(ii) $1 + x + x^2$

(iii) $4x^2y^2 - 4x^2y^2z^2 + z^2$

(iv) $3 - pq + qr - rp$

(v) $\frac{x}{2} + \frac{y}{2} - xy$

(vi) $0.3a - 0.6ab + 0.5b$

Ans. (i) Terms: $5xyz^2$ and $-3zy$

Coefficient in $5xyz^2$ is 5 and in $-3zy$ is -3 .

(ii) Terms: 1, x and x^2 .

Coefficient of x and of x^2 is 1.

(iii) Terms: $4x^2y^2$, $-4x^2y^2z^2$ and z^2 .

Coefficient in $4x^2y^2$ is 4, coefficient of $-4x^2y^2z^2$ is -4 and coefficient of z^2 is 1.

(iv) Terms: 3, $-pq$, qr and $-rp$

Coefficient of $-pq$ is -1 , coefficient of qr is 1 and coefficient of $-rp$ is -1 .

(v) Terms: $\frac{x}{2}$, $\frac{y}{2}$ and $-xy$

Coefficient of $\frac{x}{2}$ is $\frac{1}{2}$, coefficient of $\frac{y}{2}$ is $\frac{1}{2}$ and coefficient of $-xy$ is -1 .

(vi) Terms: $0.3a$, $-0.6ab$ and $0.5b$

Coefficient of $0.3a$ is 0.3, coefficient of $-0.6ab$ is -0.6 and coefficient of $0.5b$ is 0.5.

2. Classify the following polynomials as monomials, binomials, trinomials. Which polynomials do not fit in any of these three categories:

$x+y$, 1000, $x+x^2+x^3+x^4$, $7+y+5x$, $2y-3y^2$, $2y-3y^2+4y^3$, $5x-4y+3xy$, $4z-15z^2$, $ab+bc+cd+da$, pqr , p^2q+pq^2 , $2p+2q$

Ans. (i) Since $x+y$ contains two terms. Therefore it is binomial.

(ii) Since 1000 contains one terms. Therefore it is monomial.

(iii) Since $x+x^2+x^3+x^4$ contains four terms. Therefore it is a polynomial and it does not fit in above three categories.

(iv) Since $7+y+5x$ contains three terms. Therefore it is trinomial.

(v) Since $2y-3y^2$ contains two terms. Therefore it is binomial.

(vi) Since $2y-3y^2+4y^3$ contains three terms. Therefore it is trinomial.

(vii) Since $5x-4y+3xy$ contains three terms. Therefore it is trinomial.

(viii) Since $4z-15z^2$ contains two terms. Therefore it is binomial.

(ix) Since $ab+bc+cd+da$ contains four terms. Therefore it is a polynomial and it does not fit in above three categories.

(x) Since pqr contains one terms. Therefore it is monomial.

(xi) Since p^2q+pq^2 contains two terms. Therefore it is binomial.

(xii) Since $2p+2q$ contains two terms. Therefore it is binomial.

3. Add the following:

(i) $ab - bc, bc - ca, ca - ab$

(ii) $a - b + ab, b - c + bc, c - a + ac$

(iii) $2p^2q^2 - 3pq + 4, 5 + 7pq - 3p^2q^2$

(iv) $l^2 + m^2, m^2 + n^2, n^2 + l^2 + 2lm + 2mn + 2nl$

Ans. (i) $ab - bc, bc - ca, ca - ab$

$$\begin{array}{r} ab - bc \\ + bc - ca \\ - ab + ca \\ \hline 0 + 0 + 0 \end{array}$$

(ii) $a - b + ab, b - c + bc, c - a + ac$

$$\begin{array}{r} a - b - ab \\ + b - c + bc \\ - a + c + ac \\ \hline 0 + 0 + ab + 0 + bc + ac \end{array}$$

Hence the sum is 0.

Hence the sum is $ab + bc + ac$.

(iii) $2p^2q^2 - 3pq + 4, 5 + 7pq - 3p^2q^2$

$$\begin{array}{r} 2p^2q^2 - 3pq + 4 \\ - 3p^2q^2 + 7pq + 5 \\ \hline -p^2q^2 + 4pq + 9 \end{array}$$

(iv) $l^2 + m^2, m^2 + n^2, n^2 + l^2, 2lm + 2mn + 2nl$

$$\begin{array}{r}
 l^2 + m^2 \\
 + \quad m^2 + n^2 \\
 + l^2 \quad + n^2 \\
 + \quad 2lm + 2mn + 2nl \\
 \hline
 2l^2 + 2m^2 + 2n^2 + 2lm + 2mn + 2nl
 \end{array}$$

Hence the sum is

$$2(l^2 + m^2 + n^2 + lm + mn + nl).$$

4. (a) Subtract $4a - 7ab + 3b + 12$ from $12a - 9ab + 5b - 3$.

(b) Subtract $3xy + 5yz - 7zx$ from $5xy - 2yz - 2zx + 10xyz$.

(c) Subtract $4p^2q - 3pq + 5pq^2 - 8p + 7q - 10$ from

$$18 - 3p - 11q + 5pq - 2pq^2 + 5p^2q.$$

Ans. (a)

$$\begin{array}{r}
 12a - 9ab + 5b - 3 \\
 4a - 7ab + 3b + 12 \\
 (-) \quad (+) \quad (-) \quad (-) \\
 \hline
 8a - 2ab + 2b - 15
 \end{array}$$

(b)

$$\begin{array}{r}
 5xy - 2yz - 2zx + 10xyz \\
 3xy + 5yz - 7zx \\
 (-) \quad (-) \quad (+) \\
 \hline
 2xy - 7yz + 5zx + 10xyz
 \end{array}$$

(c)

$$\begin{array}{r}
 5p^2q - 2pq^2 + 5pq - 11q - 3p + 18 \\
 4p^2q + 5pq^2 - 3pq + 7q - 8p - 10 \\
 (-) \quad (-) \quad (+) \quad (-) \quad (+) \quad (+) \\
 \hline
 p^2q - 7pq^2 + 8pq - 18q + 5p + 28
 \end{array}$$