EXERCISE 7.1 PAGE NO: 7.7

1. Identify the monomials, binomials, trinomials and quadrinomials from the following expressions:

(i) a^2
(ii) $a^2 - b^2$
(iii) $x^3 + y^3 + z^3$
(iv) $x^3 + y^3 + z^3 + 3xyz$
(v) 7 + 5
(vi) a b c + 1
(vii) 3x – 2 + 5
(viii) 2x – 3y + 4
(ix) x y + y z + z x
(x) $ax^3 + bx^2 + cx + d$

Solution:

(i) Given a^2
a^2 is a monomial expression because it contains only one term

(ii) Given $a^2 - b^2$
$a^2 - b^2$ is a binomial expression because it contains two terms

(iii) Given $x^3 + y^3 + z^3$
$x^3 + y^3 + z^3$ is a trinomial because it contains three terms

(iv) Given $x^3 + y^3 + z^3 + 3xyz$
$x^3 + y^3 + z^3 + 3xyz$ is a quadrinomial expression because it contains four terms

(v) Given 7 + 5
7 + 5 is a monomial expression because it contains only one term

(vi) Given a b c + 1
a b c + 1 is a binomial expression because it contains two terms

(vii) Given 3x – 2 + 5
3x – 2 + 5 is a binomial expression because it contains two terms

(viii) Given 2x – 3y + 4
2x – 3y + 4 is a trinomial because it contains three terms

(ix) Given x y + y z + z x
x y + y z + z x is a trinomial because it contains three terms

(x) Given $ax^3 + bx^2 + cx + d$
$ax^3 + bx^2 + cx + d$ is a quadrinomial expression because it contains four terms

2. Write all the terms of each of the following algebraic expressions:
(i) 3x
(ii) 2x – 3
(iii) $2x^2 – 7$
(iv) $2x^2 + y^2 – 3xy + 4$

Solution:
(i) Given 3x
3x is the only term of the given algebraic expression.

(ii) Given 2x – 3
2x and -3 are the terms of the given algebraic expression.

(iii) Given $2x^2 - 7$
$2x^2$ and −7 are the terms of the given algebraic expression.

(iv) Given $2x^2 + y^2 – 3xy + 4$
$2x^2$, y^2, −3xy and 4 are the terms of the given algebraic expression.

3. Identify the terms and also mention the numerical coefficients of those terms:
(i) 4xy, $-5x^2y$, -3yx, $2xy^2$
(ii) $7a^2bc$,$-3ca^2b$,$-(5/2)\ abc^2$, $3/2abc^2$,$(-4/3)cba^2$

Solution:
(i) Like terms 4xy, -3yx and Numerical coefficients 4, -3
(ii) Like terms ($7a^2bc$, $-3ca^2b$) and ($-4/3cba^2$) and their Numerical coefficients 7, -3, (-4/3)

Like terms are $(-5/2abc^2)$ and $(3/2\ abc^2)$ and numerical coefficients are $(-5/2)$ and $(3/2)$

4. Identify the like terms in the following algebraic expressions:
(i) $a^2 + b^2 - 2a^2 + c^2 + 4a$
(ii) $3x + 4xy - 2yz + 5/2zy$
(iii) $abc + ab^2c + 2acb^2 + 3c^2ab + b^2ac - 2a^2bc + 3cab^2$

Solution:
(i) Given $a^2 + b^2 - 2a^2 + c^2 + 4a$
The like terms in the given algebraic expressions are a^2 and $-2a^2$.

(ii) Given $3x + 4xy - 2yz + 52zy$
The like terms in the given algebraic expressions are -2yz and 52zy.

(iii) Given $abc + ab^2c + 2acb^2 + 3c^2ab + b^2ac - 2a^2bc + 3cab^2$
The like terms in the given algebraic expressions are ab^2c, $2acb^2$, b^2ac and $3cab^2$.

5. Write the coefficient of x in the following:
(i) –12x
(ii) –7xy
(iii) xyz
(iv) –7ax

Solution:
(i) Given -12x
The numerical coefficient of x is -12.

(ii) Given -7xy
The numerical coefficient of x is -7y.

(iii) Given xyz
The numerical coefficient of x is yz.

(iv) Given -7ax
The numerical coefficient of x is -7a.

6. Write the coefficient of x^2 in the following:

(i) $-3x^2$
(ii) $5x^2yz$
(iii) $5/7x^2z$
(iv) $(-3/2)\ ax^2 + yx$

Solution:
(i) Given $-3x^2$
The numerical coefficient of x^2 is -3.

(ii) Given $5x^2yz$
The numerical coefficient of x^2 is 5yz.

(iii) Given$5/7x^2z$
The numerical coefficient of x^2 is 5/7z.

(iv) Given $(-3/2)\ ax^2 + yx$
The numerical coefficient of x^2 is – (3/2) a.

7. Write the coefficient of:
(i) y in –3y
(ii) a in 2ab
(iii) z in –7xyz
(iv) p in –3pqr
(v) y^2 in $9xy^2z$
(vi) x^3 in x^3 +1
(vii) x^2 in – x^2

Solution:
(i) Given –3y
The coefficient of y is -3.

(ii) Given 2ab
The coefficient of a is 2b.

(iii) Given -7xyz
The coefficient of z is -7xy.

(iv) Given -3pqr
The coefficient of p is -3qr.

(v) Given $9xy^2z$
The coefficient of y^2 is 9xz.

(vi) Given $x^3 + 1$
The coefficient of x^3 is 1.

(vii) Given $- x^2$
The coefficient of x^2 is -1.

8. Write the numerical coefficient of each in the following:
(i) xy
(ii) -6yz
(iii) 7abc
(iv) $-2x^3y^2z$

Solution:
(i) Given xy
The numerical coefficient in the term xy is 1.

(ii) Given -6yz
The numerical coefficient in the term - 6yz is - 6.

(iii) Given 7abc
The numerical coefficient in the term 7abc is 7.

(iv) Given $-2x^3y^2z$
The numerical coefficient in the term $-2x^3y^2z$ is -2.

9. Write the numerical coefficient of each term in the following algebraic expressions:
(i) $4x^2y - (3/2)xy + 5/2\ xy^2$
(ii) $(-5/3)x^2y + (7/4)xyz + 3$

Solution:
(i) Given $4x^2y - (3/2)\ xy + 5/2\ xy^2$

Numerical coefficient of following algebraic expressions are given below

Term	Coefficient
$4x^2y$	4
$-(3/2)\ xy$	-(3/2)
$5/2\ xy^2$	(5/2)

(ii) Given $(-5/3)x^2y + (7/4)xyz + 3$

Numerical coefficient of following algebraic expressions are given below

Term	Coefficient
$(-5/3)x^2y$	(-5/3)
(7/4)xyz	(7/4)
3	3

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

(i) $x^2y - xy^2 + 7xy - 3$

(ii) $a^3 - 3a^2 + 7a + 5$

Solution:

(i) Given $x^2y - xy^2 + 7xy - 3$

The constant term in the given algebraic expressions is -3.

(ii) Given $a^3 - 3a^2 + 7a + 5$

The constant term in the given algebraic expressions is 5.

11. Evaluate each of the following expressions for x = -2, y = -1, z = 3:

(i) (x/y) + (y/z) + (z/x)

(ii) $x^2 + y^2 + z^2 - xy - yz - zx$

Solution:

(i) Given x = -2, y = -1, z = 3

Consider (x/y) + (y/z) + (z/x)

On substituting the given values we get,

= (-2/-1) + (-1/3) + (3/-2)

The LCM of 3 and 2 is 6

= (12 – 2 – 9)/6

= (1/6)

(ii) Given x = -2, y = -1, z = 3
Consider $x^2 + y^2 + z^2 – xy – yz – zx$
On substituting the given values we get,
$= (-2)^2 + (-1)^2 + 3^2 – (-2)(-1) – (-1)(3) – (3)(-2)$
$= 4 + 1 + 9 – 2 + 3 + 6$
$= 23 – 2$
$= 21$

12. Evaluate each of the following algebraic expressions for x = 1, y = -1, z = 2, a = -2, b = 1, c = -2:
(i) ax + by + cz
(ii) $ax^2 + by^2 – cz$
(iii) axy + byz + cxy

Solution:
(i) Given x = 1, y = -1, z = 2, a = -2, b = 1, c = -2
Consider ax + by + cz
On substituting the given values
$= (-2)(1) + (1)(-1) + (-2)(2)$
$= –2 – 1 – 4$
$= –7$

(ii) Given x = 1, y = -1, z = 2, a = -2, b = 1, c = -2 Consider $ax^2 + by^2 – cz$
On substituting the given values
$= (-2) \times 1^2 + 1 \times (-1)^2 – (-2) \times 2$
$= -2 + 1 – (-4)$
$= -1 + 4$
$= 3$

(iii) Given x = 1, y = -1, z = 2, a = -2, b = 1, c = -2 Consider axy + byz + cxy
$= (-2) \times 1 \times -1 + 1 \times -1 \times 2 + (-2) \times 1 \times (-1)$
$= 2 + (-2) + 2$
$= 4 – 2$
$= 2$