



**SpeedLabs**

**MATHS**

**CBSE 9<sup>th</sup>**

**TEEVRA EDUTECH PVT. LTD.**

1. Which of the following expressions are polynomials in one variable and which are not? State reasons for your answer.

(i)  $4x^2 - 3x + 7$    (ii)  $y^2 + \sqrt{2}$    (iii)  $3\sqrt{t} + t\sqrt{2}$    (iv)  $y + \frac{2}{y}$    (v)  $x^{10} + y^3 + t^{50}$

**Ans -** (i)  $4x^2 - 3x + 7$

We can observe that in the polynomial  $4x^2 - 3x + 7$ , we have  $x$  as the only variable and the powers of  $x$  in each term are a whole number.

Therefore, we conclude that  $4x^2 - 3x + 7$  is a polynomial in one variable.

(ii)  $y^2 + \sqrt{2}$

We can observe that in the polynomial  $y^2 + \sqrt{2}$ , we have  $y$  as the only variable and the powers of  $y$  in each term are a whole number.

Therefore, we conclude that  $y^2 + \sqrt{2}$  is a polynomial in one variable.

(iii)  $3\sqrt{t} + t\sqrt{2}$

We can observe that in the polynomial  $3\sqrt{t} + t\sqrt{2}$  we have  $t$  as the only variable and the powers of  $t$  in each term are not a whole number.

Therefore, we conclude that  $3\sqrt{t} + t\sqrt{2}$  is not a polynomial in one variable.

(iv)  $y + \frac{2}{y}$

We can observe that in the polynomial  $y + \frac{2}{y}$ , we have  $y$  as the only variable and the powers of  $y$  in each term are not a whole number.

Therefore, we conclude that  $y + \frac{2}{y}$  is not a polynomial in one variable.

(v)  $x^{10} + y^3 + t^{50}$

We can observe that in the polynomial  $x^{10} + y^3 + t^{50}$ , we have x, y and t as the variables and the powers of x, y and t in each term is a whole number.

Therefore, we conclude that  $x^{10} + y^3 + t^{50}$  is a polynomial but not a polynomial in one variable.

2. Write the coefficients of  $x^2$  in each of the following:

(i)  $2 + x^2 + x$  (ii)  $2 - x^2 + x^3$  (iii)  $\frac{\pi}{2} x^2 + x$  (iv)  $\sqrt{2}x - 1$

Ans - (i)  $2 + x^2 + x$

The coefficient of  $x^2$  in the polynomial  $2 + x^2 + x$  is 1.

(ii)  $2 - x^2 + x^3$

The coefficient of  $x^2$  in the polynomial  $2 - x^2 + x^3$  is -1.

(iii)  $\frac{\pi}{2} x^2 + x$

The coefficient of  $x^2$  in the polynomial  $\frac{\pi}{2} x^2 + x$  is 0.

(iv)  $\sqrt{2}x - 1$

The coefficient of  $x^2$  in the polynomial  $\sqrt{2}x - 1$  is 0.

3. Give one example each of a binomial of degree 35, and of a monomial of degree 100.

Ans - - The binomial of degree 35 can be  $x^{35} + 9$ .

The binomial of degree 100 can be  $t^{100}$ .

4. Write the degree of each of the following polynomials:

(i)  $5x^3 + 4x^2 + 7x$  (ii)  $4 - y^2$  (iii)  $5t - \sqrt{7}$  (iv) 3

Ans - (i)  $5x^3 + 4x^2 + 7x$

We know that the degree of a polynomial is the highest power of the variable in the polynomial.

We can observe that in the polynomial  $5x^3 + 4x^2 + 7x$ , the highest power of the variable  $x$  is 3.

Therefore, we conclude that the degree of the polynomial  $5x^3 + 4x^2 + 7x$  is 3.

(ii)  $4 - y^2$

We know that the degree of a polynomial is the highest power of the variable in the polynomial.

We can observe that in the polynomial  $4 - y^2$ , the highest power of the variable  $y$  is 2.

Therefore, we conclude that the degree of the polynomial  $4 - y^2$  is 2.

(iii)  $5t - \sqrt{7}$

We know that the degree of a polynomial is the highest power of the variable in the polynomial.

We observe that in the polynomial  $5t - \sqrt{7}$ , the highest power of the variable  $t$  is 1.

Therefore, we conclude that the degree of the polynomial  $5t - \sqrt{7}$  is 1.

(iv) 3

We know that the degree of a polynomial is the highest power of the variable in the polynomial.

We can observe that in the polynomial 3, the highest power of the assumed variable  $x$  is 0.

Therefore, we conclude that the degree of the polynomial 3 is 0.

5. Classify the following as linear, quadratic and cubic polynomials:

(i)  $x^2 + x$       (ii)  $x - x^3$       (iii)  $y + y^2 + 4$       (iv)  $1 + x$       (v)  $3t$       (vi)  $r^2$       (vii)  $7x^3$

Ans - (i)  $x^2 + x$

We can observe that the degree of the polynomial  $x^2 + x$  is 2.

Therefore, we can conclude that the polynomial  $x^2 + x$  is a quadratic polynomial.

(ii)  $x - x^3$

We can observe that the degree of the polynomial  $x - x^3$  is 3.

Therefore, we can conclude that the polynomial  $x - x^3$  is a cubic polynomial.

**(iii)**  $y + y^2 + 4$

We can observe that the degree of the polynomial  $y + y^2 + 4$  is 2.

Therefore, the polynomial  $y + y^2 + 4$  is a quadratic polynomial.

**(iv)**  $1+x$  is a linear polynomial as its degree is 1.

**(v)**  $3t$  We can observe that the degree of the polynomial  $3t$  is 1.

Therefore, we can conclude that the polynomial  $3t$  is a linear polynomial.

**(vi)**  $r^2$

We can observe that the degree of the polynomial  $r^2$  is 2.

Therefore, we can conclude that the polynomial  $r^2$  is a quadratic polynomial.

**(vii)**  $7x^3$

We can observe that the degree of the polynomial  $7x^3$  is 3.

Therefore, we can conclude that the polynomial  $7x^3$  is a cubic polynomial.