

## Ex - 2.1

**Q1.** Which of the following expressions are polynomials in one variable and which are not ? State reason 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)  $x^{10} + y^3 + t^{50}$

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

This expression is a polynomial in one variable  $x$  because there is only one variable ( $x$ ) in the expression.

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

This expression is a polynomial in one variable  $y$  because there is only one variable ( $y$ ) in the expression.

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

The expression is not a polynomial because in the term  $3\sqrt{t}$ , the exponent of  $t$  is  $\frac{1}{2}$ , which is not a whole number.

(iv)  $y + \frac{2}{y} = y + 2y^{-1}$

The expression is not a polynomial because exponent of  $y$  is  $(-1)$  in term  $\frac{2}{y}$  which is not a whole number.

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

The expression is not a polynomial in one variable, it is a polynomial in 3 variables  $x$ ,  $y$  and  $t$ .

**Q2.** Write the coefficient 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)  $\sqrt{2} - 1$

**Sol.** (i)  $2 + x^2 + x$

Coefficient of  $x^2 = 1$

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

Coefficient of  $x^2 = -1$

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

Coefficient of  $x^2 = \frac{\pi}{2}$

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

Coefficient of  $x^2 = 0$

**Q3.** Give one example each of a binomial of degree 35 and of a monomial of degree 100.

**Sol.** One example of a binomial of degree 35 is  $3x^{35} - 4$ .  
One example of monomial of degree 100 is  $5x^{100}$ .

**Q4.** 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

**Sol.** (i)  $5x^3 + 4x^2 + 7x$

Term with the highest power of  $x = 5x^3$

Exponent of  $x$  in this term = 3

$\therefore$  Degree of this polynomial = 3.

(ii)  $4 - y^2$

Term with the highest power of  $y = -y^2$

Exponent of  $y$  in this term = 2

$\therefore$  Degree of this polynomial = 2.

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

Term with highest power of  $t = 5t$ .

Exponent of  $t$  in this term = 1

$\therefore$  Degree of this polynomial = 1.

(iv) 3

This is a constant which is non-zero

So, degree of this polynomial = 0

**Q5.** 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)  $7x^2$

**Sol.** (i) Quadratic      (ii) Cubic      (iii) Quadratic  
(iv) Linear      (v) Linear      (vi) Quadratic  
(vii) Quadratic