

NCERT Solutions for Class 9th Maths Chapter 2 Polynomials
Exercise No: 2.1

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

Solution:

(i)

$4x^2 - 3x + 7$, this is a polynomial in one variable, because it has only 'x' as a variable.

(ii)

$y^2 + \sqrt{2}$, this is a polynomial in one variable, because it has only one variable 'y'.

(iii)

$3\sqrt{t} + t\sqrt{2}$, this is not a polynomial, though there is only one variable 't', the degree of the variable is not a whole number and that is the reason of not being a polynomial.

(iv)

$y + \frac{2}{y}$, this is not a polynomial, the reason is that, the degree of the variable is not a whole number.

(v)

$x^{10} + y^3 + t^{50}$, this is a polynomial with three variables, which are 'x', 'y' and 't'.

Question 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) $\sqrt{2}x - 1$

Solution:

- (i) $2 + x^2 + x$, the coefficient of x^2 is 1
- (ii) $2 - x^2 + x^3$, the coefficient of x^2 here is -1.
- (iii) $\frac{\pi}{2}x^2 + x$, here the coefficient of x^2 is $\frac{\pi}{2}$
- (iv) $\sqrt{2}x - 1$, the coefficient of x^2 is 0.

Question 3:

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

Solution:

The solution to this problem can have many answers, we can write as many binomials and monomials of degree 35 and 100 respectively. An example is as follows,

$45y^{35} - 22$, this is an example of a binomial of degree 35.

$4x^{100}$, this is an example of a monomial of degree 100.

Question 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

Solution:

The highest power of the variable in a polynomial is known as the degree of the polynomial and the degree of a non-zero constant polynomial is zero.

- (i) $5x^3 + 4x^2 + 7x$, here the variable has the highest power as 3, so the degree of the polynomial is 3.
- (ii) $4 - y^2$, here the variable has the highest power as 2, so the degree of the polynomial is 2.
- (iii) $5t - \sqrt{7}$, here the highest power of the variable is 1, and that is the degree of the polynomial.
- (iv) 3, it can be written as $3x^0$, and the power of the variable is 0, so the degree of the polynomial is 0.

Question 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) $7x^3$

Solution:

We know that the linear polynomial has degree 1; quadratic polynomial has degree 2 and cubic polynomial has degree 3. Now,

- (i) $x^2 + x$, this is a quadratic polynomial as its degree is 2.
- (ii) $x - x^3$, this is a cubic polynomial as its degree is 3.
- (iii) $y + y^2 + 4$, this is a quadratic polynomial as its degree is 2.
- (iv) $1 + x$, it is a linear polynomial because of degree 1.
- (v) $3t$, it is a linear polynomial because of degree 1.
- (vi) r^2 , it is a quadratic polynomial because the degree is 2.
- (vii) $7x^3$, this is a cubic polynomial as its degree is 3.