NCERT solutions for class 9 Maths Polynomials Ex 2.1

Q1. 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.

Q2. 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 $\frac{\pi}{2}$.

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

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

Q3. 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}.

Q4. Write the degree of each of the following polynomials:

(i) $p(x)=5x^3+4x^2+7x$

(ii) $p(y)=4-y^2$

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

(iv) $f(x)=3$

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.

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) $7x^3$

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) $1+x$

We can observe that the degree of the polynomial $(1+x)$ is 1.

Therefore, we can conclude that the polynomial $1+x$ is a linear polynomial.

(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.

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