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Chapter - 8
Division of Algebraic Expressions

Q.1 Write the degree of each of the following polynomials.

(i) $2x^2 + 5x^2 - 7$

(ii) $5x^2 - 3x + 2$

(iii) $2x + x^2 - 8$

(iv) $\frac{1}{2}y^7 - 12y^6 + 48y^5 - 10$

(v) $3x^3 + 1$

(vi) 5

(vii) $20x^3 + 12x^2y^2 - 10y^2 + 20$

Solution (i) $2x^2 + 5x^2 - 7 = 7x^2 - 7 \rightarrow$ degree 2

(ii) 2

(iii) 2

(iv) 7

(v) 3

(vi) 0

(vii) 4

Q.2 Which of the following expressions are not polynomials?

(i) $x^2 + 2x^{-2}$

(ii) $\sqrt{ax} + x^2 = x^3$

(iii) $3y^3 - \sqrt{5}y + 9$

(iv) $ax^{1/2} + ax + 9x^2 + 4$

(v) $3x^2 + 2x^1 + 4x + 5$

Sol: (i) $x^2 + 2x^{-2}$

$\therefore$ exponent of variable is -2 , which is not a whole number

$\therefore$ It is not a polynomial.

(iv) $\sqrt{a}x + x^2 - x^3 \rightarrow$ yes, it is a polynomial.

(iii) $3y^3 - \sqrt{5}y + 9 \rightarrow$ yes, it is a polynomial

(iv) $ax^{1/2} + ax + 9x^2 + 4$

$\therefore \frac{1}{2}$ is not a whole number.

It is not a polynomial.

(v) $3x^{-2} + 2x^{-1} + 4x + 5$

here -2 and -1 are not whole no.

$\therefore$ It is not a polynomial.

Q3 Write each of the following polynomials in the standard form. Also write their degree.

(i) $x^2 + 3 + 6x + 5x^4$

Sol: Standard form = $5x^4 + x^2 + 6x + 3$
degree = 4

(ii) $a^2 + 4 + 5a^6$

Standard form = $5a^6 + a^2 + 4$
degree = 6

(iii) $(x^2 - 1)(x^3 - 4) = x^5 - 4x^2 - x^3 + 4$
 $= x^5 - x^3 - 4x^2 + 4$

degree = 5

$$\begin{aligned}
 \text{(iv)} \quad & (y^3 - 2)(y^3 + 11) \\
 &= y^6 + 11y^3 - 2y^3 - 22 \\
 &= y^6 + 9y^3 - 22
 \end{aligned}$$

degree = 6

$$\begin{aligned}
 \text{(v)} \quad & \left(a^3 - \frac{3}{8}\right) \left(a^3 + \frac{16}{17}\right) \\
 &= a^6 + \left(\frac{16}{17}a^3 - \frac{3}{8}a^3\right) - \frac{48}{136} \\
 &= a^6 + \frac{27}{136}a^3 - \frac{48}{136}
 \end{aligned}$$

degree = 6

$$\begin{aligned}
 \text{(vi)} \quad & \left(a + \frac{3}{4}\right) \left(a + \frac{4}{3}\right) = a^2 + \left(\frac{4}{3}a + \frac{3}{4}a\right) + 1 \\
 &= a^2 + \frac{25}{12}a + 1
 \end{aligned}$$

degree = 2