EXERCISE 8.1 PAGE NO: 8.2

1. Write the degree of each of the following polynomials:
(i) $2x^3 + 5x^2 - 7$
(ii) $5x^2 – 3x + 2$
(iii) $2x + x^2 - 8$
(iv) $1/2y^7 – 12y^6 + 48y^5 - 10$
(v) $3x^3 + 1$
(vi) 5
(vii) $20x^3 + 12x^2y^2 – 10y^2 + 20$
Solution:
(i) $2x^3 + 5x^2 - 7$
We know that in a polynomial, degree is the highest power of the variable.
The degree of the polynomial, $2x^3 + 5x^2 - 7$ is 3.

(ii) $5x^2 – 3x + 2$
The degree of the polynomial, $5x^2 – 3x + 2$ is 2.

(iii) $2x + x^2 – 8$
The degree of the polynomial, $2x + x^2 – 8$ is 2.

(iv) $1/2y^7 – 12y^6 + 48y^5 – 10$
The degree of the polynomial, $1/2y^7 – 12y^6 + 48y^5 – 10$ is 7.

(v) $3x^3 + 1$
The degree of the polynomial, $3x^3 + 1$ is 3

(vi) 5
The degree of the polynomial, 5 is 0 (since 5 is a constant number).

(vii) $20x^3 + 12x^2y^2 – 10y^2 + 20$
The degree of the polynomial, $20x^3 + 12x^2y^2 – 10y^2 + 20$ is 4.

2. Which of the following expressions are not polynomials?
(i) $x^2 + 2x^{-2}$
(ii) $\sqrt{(ax)} + x^2 – x^3$
(iii) $3y^3 - \sqrt{5y} + 9$
(iv) $ax^{1/2} + ax + 9x^2 + 4$
(v) $3x^{-3} + 2x^{-1} + 4x + 5$

Solution:
(i) $x^2 + 2x^{-2}$
The given expression is not a polynomial.
Because a polynomial does not contain any negative powers or fractions.

(ii) $\sqrt{(ax)} + x^2 – x^3$
The given expression is not a polynomial.
Because the polynomial has 1/2 as the power of variable x which is not a non negative integer.

(iii) $3y^3 - \sqrt{5}y + 9$
The given expression is a polynomial.
Because the polynomial has positive powers.

(iv) $ax^{1/2} + ax + 9x^2 + 4$
The given expression is not a polynomial.
Because a polynomial does not contain any negative powers or fractions.

(v) $3x^{-3} + 2x^{-1} + 4x + 5$
The given expression is not a polynomial.
Because a polynomial does not contain any negative powers or fractions.

3. Write each of the following polynomials in the standard from. Also, write their degree:
(i) $x^2 + 3 + 6x + 5x^4$
(ii) $a^2 + 4 + 5a^6$
(iii) $(x^3 - 1) (x^3 - 4)$
(iv) $(y^3 - 2) (y^3 + 11)$
(v) $(a^3 – 3/8) (a^3 + 16/17)$
(vi) $(a + 3/4) (a + 4/3)$
Solution:
(i) $x^2 + 3 + 6x + 5x^4$
The standard form of the polynomial is written in either increasing or decreasing order of their powers.
$3 + 6x + x^2 + 5x^4$ or $5x^4 + x^2 + 6x + 3$
The degree of the given polynomial is 4.

(ii) $a^2 + 4 + 5a^6$
The standard form of the polynomial is written in either increasing or decreasing order of their powers.

$4 + a^2 + 5a^6$ or $5a^6 + a^2 + 4$
The degree of the given polynomial is 6.

(iii) $(x^3 - 1)(x^3 - 4)$
$x^6 – 4x^3 – x^3 + 4$
$x^6 – 5x^3 + 4$
The standard form of the polynomial is written in either increasing or decreasing order of their powers.
$x^6 – 5x^3 + 4$ or $4 – 5x^3 + x^6$
The degree of the given polynomial is 6.

(iv) $(y^3 - 2)(y^3 + 11)$
$y^6 + 11y^3 – 2y^3 – 22$
$y^6 + 9y^3 – 22$
The standard form of the polynomial is written in either increasing or decreasing order of their powers.
$y^6 + 9y^3 – 22$ or $-22 + 9y^3 + y^6$
The degree of the given polynomial is 6.

(v) $(a^3 – 3/8)(a^3 + 16/17)$
$a^6 + 16a^3/17 – 3a^3/8 – 6/17$
$a^6 + 77/136a^3 – 48/136$
The standard form of the polynomial is written in either increasing or decreasing order of their powers.
$a^6 + 77/136a^3 – 48/136$ or $-48/136 + 77/136a^3 + a^6$
The degree of the given polynomial is 6.

(vi) $(a + 3/4)(a + 4/3)$
$a^2 + 4a/3 + 3a/4 + 1$
$a^2 + 25a/12 + 1$
The standard form of the polynomial is written in either increasing or decreasing order of their powers.
$a^2 + 25a/12 + 1$ or $1 + 25a/12 + a^2$
The degree of the given polynomial is 2.