Mathematics

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(Chapter – 2) (Polynomials)(Exemplar Problems)

(Class – IX)

Exercise 2.2

Question 1:

Which of the following expressions are polynomials? Justify your answer:

(i) 8 (ii) $\sqrt{3}\,x^2 - 2x$ (iii) $1 - \sqrt{5x}$ (iv) $\frac{1}{5x^{-2}} + 5x + 7$

(v) $\frac{(x-2)(x-4)}{x}$ (vi) $\frac{1}{x+1}$ (vii) $\frac{1}{7}a^3 - \frac{2}{\sqrt{3}}a^2 + 4a - 7$ (viii) $\frac{1}{2x}$

Answer 1:

(i) 8

Given expression is $8 = 8x^0$

As the exponent of the variable is a whole number.

Hence, it is a polynomial.

(ii) $\sqrt{3}\,x^2 - 2x$

Given expression is $\sqrt{3}\,x^2 - 2x$

As the exponent of the variable is a whole number.

Hence, it is a polynomial.

(iii) $1 - \sqrt{5x}$

Given expression is $1 - \sqrt{5x} = 1 - \sqrt{5}(x)^{\frac{1}{2}}$

As the exponent of the variable is ½ (not a whole number).

Hence, it is not a polynomial.

(iv) $\frac{1}{5x^{-2}} + 5x + 7$

Given expression is $\frac{1}{5x^{-2}} + 5x + 7 = \frac{1}{5}x^2 + 5x + 7$

As the exponent of the variable is a whole number.

Hence, it is a polynomial.

(v) $\frac{(x-2)(x-4)}{x}$

Given expression is $\frac{(x-2)(x-4)}{x} = \frac{x^2-6x+8}{x} = 1 - 6x^{-1} + 8x^{-2}$

As the exponent of the variable is not a whole number.

Hence, it is not a polynomial.

(vi) $\frac{1}{x+1}$

Given expression is $\frac{1}{x+1}$

As the exponent of the variable is not a whole number.

Hence, it is not a polynomial.

(vii) $\frac{1}{7}a^3 - \frac{2}{\sqrt{3}}a^2 + 4a - 7$

Given expression is $\frac{1}{7}a^3 - \frac{2}{\sqrt{3}}a^2 + 4a - 7$

As the exponent of the variable is a whole number.

Hence, it is a polynomial.

(viii) $\frac{1}{2x}$

Given expression is $\frac{1}{2x} = \frac{1}{2}x^{-1}$

As the exponent of the variable is – 1 (not a whole number).

Hence, it is not a polynomial.