VIDYA SHREE ACADEMY
SR. SEC. SCHOOL
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VSA — A Real English Medium School
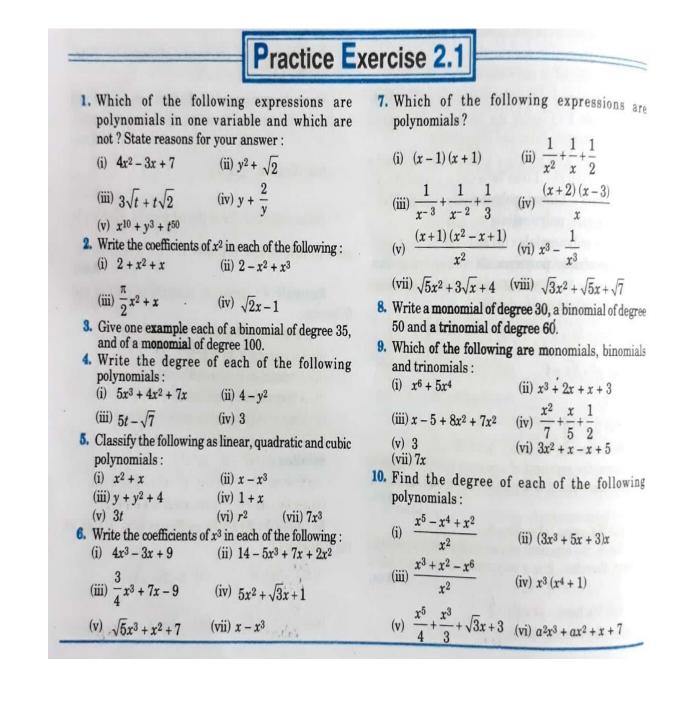
Little Steps — Pre Primary wing of VSA

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Subject – Maths.   Class- 9   Topic – Ch. 2 Polynomials

Refer to Video #9 and solve the following exercise:

Practice Exercise 2.1

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) $y + \dfrac{2}{y}$

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

2. Write the coefficients of x^2 in each of the following :

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

   (iii) $\dfrac{\pi}{2}x^2 + x$ (iv) $\sqrt{2}x - 1$

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

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

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) $7x^3$

6. Write the coefficients of x^3 in each of the following :

   (i) $4x^3 - 3x + 9$ (ii) $14 - 5x^3 + 7x + 2x^2$

   (iii) $\dfrac{3}{4}x^3 + 7x - 9$ (iv) $5x^2 + \sqrt{3}x + 1$

   (v) $\sqrt{5}x^3 + x^2 + 7$ (vii) $x - x^3$

7. Which of the following expressions are polynomials ?

   (i) $(x - 1)(x + 1)$ (ii) $\dfrac{1}{x^2} + \dfrac{1}{x} + \dfrac{1}{2}$

   (iii) $\dfrac{1}{x-3} + \dfrac{1}{x-2} + \dfrac{1}{3}$ (iv) $\dfrac{(x+2)(x-3)}{x}$

   (v) $\dfrac{(x+1)(x^2 - x + 1)}{x^2}$ (vi) $x^3 - \dfrac{1}{x^3}$

   (vii) $\sqrt{5}x^2 + 3\sqrt{x} + 4$ (viii) $\sqrt{3}x^2 + \sqrt{5}x + \sqrt{7}$

8. Write a monomial of degree 30, a binomial of degree 50 and a trinomial of degree 60.

9. Which of the following are monomials, binomials and trinomials :

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

   (iii) $x - 5 + 8x^2 + 7x^2$ (iv) $\dfrac{x^2}{7} + \dfrac{x}{5} + \dfrac{1}{2}$

   (v) 3   (vi) $3x^2 + x - x + 5$

   (vii) $7x$

10. Find the degree of each of the following polynomials :

   (i) $\dfrac{x^5 - x^4 + x^2}{x^2}$ (ii) $(3x^3 + 5x + 3)x$

   (iii) $\dfrac{x^3 + x^2 - x^6}{x^2}$ (iv) $x^3(x^4 + 1)$

   (v) $\dfrac{x^5}{4} + \dfrac{x^3}{3} + \sqrt{3}x + 3$ (vi) $a^2x^3 + ax^2 + x + 7$

1. Find the value of the polynomial $5x - 4x^2 + 3$ at :
   (i) $x = 0$ (ii) $x = -1$ (iii) $x = 2$

2. Find $p(0)$, $p(1)$ and $p(2)$ for each of the following polynomials :
   (i) $p(y) = y^2 - y + 1$
   (ii) $p(t) = 2 + t + 2t^2 - t^3$

   (ii) $p(x) = 5x - \pi$, $x = \dfrac{4}{5}$

   (iii) $p(x) = x^2 - 1$, $x = 1, -1$
   (iv) $p(x) = (x + 1)(x - 2)$, $x = -1, 2$
   (v) $p(x) = x^2$, $x = 0$

   (vi) $p(x) = lx + m$, $x = \dfrac{-m}{l}$

   (vii) $p(x) = 3x^2 - 1$, $x = \dfrac{-1}{\sqrt{3}}, \dfrac{2}{\sqrt{3}}$

   (viii) $p(x) = 2x + 1$, $x = \dfrac{1}{2}$

4. Find the zero of the polynomial in each of the following cases :
   (i) $p(x) = x + 5$ (ii) $p(x) = x - 5$
   (iii) $p(x) = 2x + 5$ (iv) $p(x) = 3x - 2$
   (v) $p(x) = 3x$ (vi) $p(x) = ax$, $a \neq 0$
   (vii) $p(x) = cx + d$, $c \neq 0$; where c, d are real numbers.

5. Fill in the blanks :
   (i) Degree of the zero polynomial is not ....
   (ii) Degree of biquadratic polynomial is ....
   (iii) .... is a zero of $x + 5$.
   (iv) There are .... terms in binomial.

   (iii) $p(x) = x^3$
   (iv) $p(x) = (x - 1)(x + 1)$

3. Verify whether the following are zeroes of the polynomial, indicated against them :

   (i) $p(x) = 3x + 1$, $x = \dfrac{-1}{3}$

   (v) A quadratic polynomial has .... zeroes.

6. State whether the following statements are true or false :
   (i) Degree of zero polynomial is zero.
   (ii) Degree of a cubic polynomial is 2.
   (iii) A cubic polynomial has 3 zeroes.
   (iv) Every polynomial is a trinomial.
   (v) 0 and 3 are the only zeroes of $t^2 - 3t$

7. Find the values of the polynomial $x^3 - 2x^2 + 3x + 5$ at :
   (i) $x = 0$ (ii) $x = 1$ (iii) $x = -2$

8. Find the value of each of the following polynomials at the indicated values of variables :

   (i) $p(x) = 5x^2 - \dfrac{4}{5}$; $x = \dfrac{1}{2}, \dfrac{-1}{2}$

   (ii) $p(x) = 3x^3 + 2x - 3x^2 + 4$; $x = 2, -2$

   (iii) $p(y) = 5y^2 + 4$; $y = \dfrac{-2}{\sqrt{5}}, \dfrac{4}{\sqrt{5}}$

   (iv) $q(y) = 2y^2 + 3\pi^2$; $y = \pi, -2\pi$

9. Find the zero of the polynomial in each of the following cases :
   (i) $p(x) = 2x - 3$ (ii) $p(y) = ay - b$, $a \neq 0$
   (iii) $q(x) = 4\pi x + 3$ (iv) $q(t) = (t + 1)^2 - (t - 1)^2$