CLASS - IX MATHEMATICS – CHAPTER 02

POLYNOMIALS

Name: Date:

01. Which of the following expression is a monomial

(a). 3 + x (b). $4x^3$ (c). $x^6 + 2x^2 + 2$ (d). None of these

02. Which of the following expression is a polynomial?

(a). $x^3 - 1$ (b). $\sqrt{x} + 2$ (c)$x^2 - \frac{1}{x^2}$ (d). $\sqrt{t} + 5t - 1$

03. A polynomial of degree 3 in x has at most

(a). 5 terms (b). 3 terms (c). 4 terms (d). 1 term

04. The coefficient of x^2 in the polynomial $2x^3 + 4x^2 + 3x + 1$ is

(a). 2 (b). 3 (c). 1 (d). 4

05. The monomial of degree 50 is

(a). $x^{50} + 1$ (b). $2x^{50}$ (c). x+50 (d). 50

06. If $P(x) = x^3 - 1$, then the value of P(1) + P(-1) is

(a). 0 (b). 1 (c). 2 (d). - 2

07. when polynomial $x^3 + 3x^2 + 3x + 1$ is divided by x + 1, the remainder is

(a). 1 (b). 0 (c). 8 (d). – 6

08. The value of K for which x – 1 is a factor of the polynomial $4x^3 + 3x^2 - 4x + K$ is

(a). 0 (b). 3 (c). – 3 (d). 1

09. The factors $12x^2 - x - 6$

(a). (3x – 2) (4x + 3) (b). (12x + 1) (x – 6) (c). (12x – 1) (x + 6) (d). (3x + 2) (4x – 3)

10. The value of 102^3 is

(a). 1061208 (b). 1001208 (c). 1820058 (d). none of these

11. $(a-b)^3 + (b-c)^3 + (c-a)^3$ is equal to

(a). 3abc (b). 3(a-b) (b-c) (c-a) (c). $3a^3b^3bc^3$ (d). $[a-(b+c)]^3$

12. The zeroes of the polynomial P(x) = x (x-2) (x+3) are

(a). 0 (b). 0, 2, 3 (c). 0, 2, -3 (d). none of these

13. If (x+1) and (x-1) are factors of $Px^3 + x^2 - 2x + 9$ then value of p and q are

(a). p = -1, q = 2 (b). p = 2, q = -1 (c). p = 2, q = 1 (d). p = -2, q = -2

14. If x + y + z = 0, then $x^3 + y^3 + z^3$ is

(a). xyz (b). 2xyz (c). 3xyz (d). 0

15. The value of $(x - a)^3 + (x - b)^3 + (x - c)^3 - 3 (x - a) (x - b) (x - c)$ when a + b + c = 3x, is

(a). 3 (b). 2 (c). 1 (d). 0

16. Factors of $x^2 + 3\sqrt{2}x + 4$ are

(a). $(x + 2\sqrt{2}) (x - \sqrt{2})$ (b). $(x + 2\sqrt{2}) (x + \sqrt{2})$ (c). $(x - 2\sqrt{2}) (x + \sqrt{2})$ (d). $(x - 2\sqrt{2}) (x - \sqrt{2})$

17. The degree of constant function is

(a). 1 (b). 2 (c). 3 (d). 0

18. $x^3 + y^3 + z^3 - 3xyz$ is

(a). $(x + y - z)^3$ (b). $(x - y + z)^3$ (c). $(x + y + z)^3 - 3xyz$ (d). $(x+y+z)(x^2 + y^2 + z^2 - xy - yz - zx)$

19. The expended form of $(x + y - z)^2$ is

(a). $x^2 + y^2 + z^2 + 2xy + 2yz + 2zx$ (b). $x^2 + y^2 - z^2 + 2xy - 2yz - 2xz$

(c). $x^2 + y^2 + z^2 + 2xy - 2yz - 2zx$ (d). $x^2 + y^2 + z^2 + 2xy + 2yx + 2xz$

20. A linear polynomial

(a). May have one zero (b). has one and only one zero

(c). May have two zero (d). May have more than one zero

Q01. Factorize

(**a**). $x^3 + 8y^3 + 64z^3 - 24$ **(b)**. $x^2 + y - xy - x$ **(c)**. $1 - a^2 - b^2 - 2ab$ (**d**). $\frac{3}{2}x^2 - x - 4/3$

(e). $8a^3 - b^3 - 12a^2b + 6ab^2$ **(f)**. $64y^3 + 125z^3$ **(g)** $27m^3 - 343n^3$ (**h**). $3(x+y)^2 - 5(x+y) + 2$

(i). $x^6 + 3y^6 - z^6 + 6x^2y^2z^2$ **(j)**. $x^3 + y^3 + z^3 - 9xyz$ **(k)**. $x^6 - 64$

(l). $12(y^2 + 7y)^2 - 8(y^2 + 7y)(2y - 1) - 15(2y - 1)^2$ **(m)**$(2x - 3y)^3 + (3y - 4z)^3 + (4z - 2x)^3$

(n). $2y^3 - 4y^2 - 2y + 4$ **(o)**. $2x^2 + 7x + 3$ **(p)**. $x^3 + 13x^2 + 32x + 20$

Q02. Divide f(x) by g(x) & verify that the remainder $f(x) = x^3 + 4x^2 - 3x - 10$, $g(x) = x + 4$

Q03. Using remainder theorem find the remainder when f(x) is divided by g(x)

$f(x) = x^{24} - x^{19} - 2$ $g(x) = x + 1$

Q04. Using factor theorem check whether g(x) is factor of p(x), $p(x) = x^3 - 4x^2 + x + 6$, $g(x) = x - 3$

Q05. Find the value of K it $x - 2$ is factor of $4x^3 + 3x^2 - 4x + K$

Q06. Find K if $x + 1$ is a factor of $P(x) = Kx^2 - 2x + 2$

Q07. If $x - 3$ and $x - 1/3$ are both factors of $px^2 + 5x + r$, then show that $P = r$

Q08. Find the values of m and n if the polynomial $2x^3 + mx^2 + nx - 14$ has $x - 1$ and $x + 2$ as its factors.

Q09. Find m and n it $x - 1$ and $x - 2$ exactly divide the polynomial $x^3 + mx^2 - nx + 10$

Q10. Find the value of k, if x-1 is factor of P(x) and $P(x) = 3x^2 + kx + \sqrt{2}$

Q11. Without actually Calculating the cubes, find the value of $(-12)^3 + (7)^3 + (5)^3$

Q12. Using suitable identify expand

(a). $(\frac{5}{4}x + \frac{3}{4})^3$ (b). $(\frac{a}{2} - \frac{b}{3} + 1)^2$ (c). $(\frac{2}{3}x + 1)^3$ (d). $(x - \frac{2}{3}y)^3$

Q13. Using factor theorem factorise $f(x) = x^2 - 5x + 6$

Q14. Without actual division, prove that the polynomial $2x^3 + 4x^2 + x - 34$ is exactly divisible by $(x - 2)$

Q15. Check whether $7 + 3x$ is a factor of $3x^2 + 7x$

Q16. Without actually calculating the cubes. Find the value of $(26)^3 + (-15)^3 + (11)^3$

Q17. If $x^2 - bx + c = (x + p)(x - q)$ then factorise $x^2 - bxy + cy^2$

Q18. Show that 5 is a zero of polynomial $2x^3 - 7x^2 - 16x + 5$

Q19. Find the integral zeroes of the polynomial $x^3 + 3x^2 - x - 3$

Q20. Verify each of the following identifies

(a). $x^3 + y^3 = (x + y)(x^2 - xy + y^2)$ (b). $x^3 - y^3 = (x - y)(x^2 + xy + y^2)$

Q21. Evaluate

(a). 101^2 (b). 99^3 (c). 105 x 95

Q22. Using identify $(a + b)^3 = a^3 + b^3 + 3ab\ (a + b)$ drive the formula $a^3 + b^3 = (a + b)(a^2 – ab + b^2)$

Q23. Using remainder theorem factorise $x^3 - 3x^2 – x + 3$.

Q24. Find the values of m and n so that the polynomial $x^3 - mx^2 - 13x+n$ has x-1 and x+3 as factors.

Q25. Prove that $x^2 + 6x + 15$ has no zero.

Q26. The volume of a cuboid is given by the expression $3x^3-12x$. Find the possible expressions for its dimensions.

Q27. If $y^2 + ay^2 +by + 6$ is divisible by y–2 and leaves remainder 3 when divided by y–3, find the values of a and b.

Q28. The volume of a cuboid is given by the algebraic expression $ky^2 -6ky + 8k$. Find the possible expressions for the dimensions of the cuboid.