



CLASS IX ASSIGNMENT

MATHEMATICS

CHAPTER – 2 POLYNOMIALS

Q.1 If $4x^2 + y^2 = 40$ and $xy = 6$, find the value of $2x + y$.

Q.2. If the polynomials $ax^3 + 4x^2 + 3x - 4$ and $x^3 - 4x + a$ leave the same remainder when divided by $(x - 3)$, find the value of a .

Q.3. Factorise $(a^2 - 2a)^2 - 23(a^2 - 2a) + 120$

Q.4. Show that if $a + b$ is not zero, then the equation $a(x - a) = 2ab - b(x - b)$, has a solution $x = a + b$.

Q.5. Show that if $2(a^2 + b^2) = (a + b)^2$, then $a = b$.

Q.6. Find the values of m and n in the polynomial $2x^3 + mx^2 + nx - 14$ such that $(x - 1)$ and $(x + 2)$ are its factors.

Q.7. For what value of K , $x^2 + kx + 6 = (x + 2)(x + 3)$ for all x ?

Q.8. If $p(x) = x^3 - x^2 + x + 1$, then what is the value of $\frac{p(1) + p(-1)}{2}$.

Q.9. What is the value of k for which $x - 1$ is a factor of $p(x) = x^3 - kx^2 - 11x - 6$?

Q.10. Find the value of $p(x) = 5x - 4x^2 + 3$ for $x = -1$.

Q.11. Find the remainder, if $x^{49} + 61$ is divided by $x + 1$.

Q.12. Factorise : $x - 8xy^3$.

Q.13. What is the degree of a zero polynomial?

Q.14. Factorise : $(x + 1)^2 - (y - 1)^2$



Q.15. Factorise : $x^2 + y - xy - x$

Q.16. Factorise : $a^2 + b^2 + 2ab + 2bc + 2ca$

Q.17. Factorise : $a^3 - b^3 + 1 + 3ab$

Q.18. If 2 and -2 are zeros of the polynomial $p(x)$. Write the polynomial $p(x)$.

Q.19. Use remainder theorem to find the remainder when $p(x) = x^3 + 3x^2 + 3x + 1$ is divided by $x - \frac{1}{2}$.

Q.20. Determine if $(x + 1)$ is a factor of $p(x) = x^3 - x^2 - (2 - \sqrt{2})x - \sqrt{2}$.

Q.21. Find the value of 'k' if $(x - 1)$ is a factor of $p(x) = kx^2 - 3x + k$.

Q.22. If $(x - 3)$ is a factor of $p(x) = x^3 - mx^2 + (m + 1)x - 12$ find the value of 'm'.

Q.23. Write the coefficient of x^2 in the expansion of $(x - 2)^3$

Q.24. Find the value of polynomial $12x^2 - 7x + 1$ at $x = \frac{1}{4}$

Q.25. Find the factors of $1 - x^3$

Q.26. If $x^2 - 1$ is a factor of $ax^3 + bx^2 + cx + d$ show that $a + c = 0$

Q.27. If $x + y = 9$ and $xy = 20$, then find the value of $x^2 + y^2$

Q.28. Simplify : $(a + b + c)^2 - (a - b - c)^2$

Q.29. If $x^2 + \frac{1}{x^2} = 7$, then find the value of $x^3 + \frac{1}{x^3}$

Q.30. Factorise : $(x^2 - 4x)(x^2 - 4x - 1) - 20$.

Q.31. If $a + b + c = 9$ and $ab + bc + ca = 26$, find $a^2 + b^2 + c^2$.

Q.32. If a, b, c are all non zero and $a + b + c = 0$ prove that $\frac{a^2}{bc} + \frac{b^2}{ca} + \frac{c^2}{ab} = 3$.



Q.33. Factorise : $(x + y)^2 - 7(x^2 - y^2) + 12(x - y)^2$.

Q.34. If both $(x - 2)$ and $(x - \frac{1}{2})$ are factors of $px^2 + 5x + r$, show that $p = r$.

Q.35. Simplify : $\frac{1.2 \times 1.2 \times 1.5 - 0.2 \times 0.2 \times 0.2}{1.2 \times 1.2 + 1.2 \times 0.2 + 0.2 \times 0.2}$

Q.36. What must be added to $4x^4 - 2x^3 - 6x^2 + x - 5$, so that the result is divisible by $2x^2 + x - 1$.

Q.37. Factorise $(5x - 7y)^3 + (9z - 5x)^3 + (7y - 9z)^3$

Q.38. Divide the polynomial $3x^4 - 4x^3 - 3x - 1$ by $x - 1$ and find its quotient and remainder.

Q.39. What must be subtracted from $4x^4 - 2x^3 - 6x^2 + x - 5$ so that the result is exactly divisible by $4x^2 + 2x$.

Q.40. If $p = 2 - a$, prove that $a^3 + 6ap + p^3 - 8 = 0$.

Q.41. Let R_1 and R_2 are the remainders when the polynomials $x^3 + 2x^2 - 5ax - 7$ and $6x^3 + ax^2 - 12x + 6$ are divided by $x + 1$ and $x - 2$ respectively. If $2R_1 + R_2 = 6$, find the value of a .

Q.42. If $(x - 2)$ and $(x + 3)$ are the factors of $p(x) = ax^3 + 3x^2 - bx - 12$. Find the value of 'a' and 'b'.

Q.43. If $(x - 5)$ is a factor of $p(x) = x^3 + ax^2 + bx - 20$ and leaves a remainder (-2) when divided by $(x - 3)$ find the values of a and b .

Q.44. Factorise the following :

a) $15 - 26xy + 8x^2y^2$

b) $30m^2 + 25mn - 30n^2$

c) $3 - 8(2x - y) + 4(2x - y)^2$

d) $x^2 - 5\sqrt{2x} - 12$



e) $9x^2 - 4y^2 - 6x + 4y$

f) $4a^2 - 12a + 9 - x^2 + 2xy - y^2$

Q.45. Evaluate the following using appropriate identify.

a) $(9.8)^2$

b) 0.92×1.08

c) 95×96

d) $(102)^3$

Q.46. Write in expanded form

a) $\left(x - \frac{1}{2}y + \frac{1}{3}z\right)^2$

b) $\left(\frac{4}{3}x + \frac{3}{4}y\right)^3$

c) $\left(p^2 - \frac{3}{2}q^2\right)^3$

d) $(3x^2 + y - 3)^2$

Q.47. Factorise :

a) $2\sqrt{2}a^3 + 16\sqrt{2}b^3 + c^3 - 12abc$

b) $(x + y)^3 + (y + z)^3 + (z + x)^3 - 3(x + y)(y + z)(z + x)$

c) $x^3(y - z)^3 + y^3(z - x)^3 + z^3(x - y)^3$

Q.48. Factorise :

a) $x^3 - 13x^2 + 32x + 20$

b) $3x^3 + x^2 - 38x + 24$

Q.49. Factorise : $5\sqrt{5}x^2 + 30x + 8\sqrt{5}$

Q.50. Simplify : $(2x - 5y)^3 - (2x + 5y)^3$

Q.51. The amount Sahil donated from his pocket money to P.M's flood relief fund is given by product of the zero of the polynomial $p(y) = \frac{y^3}{27} - 1$ and 1000.

a) Find the donated amount

b) Also comment upon Sahil's nature.



Q.52. Lara donated to a school a piece of land to be developed as a green area.

a) Give possible expressions for the length and breadth of the garden whose area is given as $16a^2 - 32a + 15$ sq. units.

b) What values of Lara is depicted here?

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