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CLASS – IX SUBJECT – MATHEMATICS CHAPTER – POLYNOMIALS

1. Use factor theorem to determine whether $x+\sqrt{2}$ is a factor of $2\sqrt{2}\,x^2 + 5x + \sqrt{2}$.

2. Find the value of k if (x - 3) is a factor of $k^2x^2 – kx – 2$.

3. Find the values of a and b so that the polynomial $x^3 – ax^2 – 13x + b$ has x – 1 and x + 3 as factors.

4. Without actual division, prove that $2x^4 – 6x^3 + 3x^2 + 3x – 2$ is exactly divisible by

   $x^2 – 3x + 2$.

5. What must be added to $x^3 – 3x^2 + 4x – 13$ to obtain a polynomial which is exactly divisible by x – 3 ?

6. What must be subtracted from $4x^3 + 16x^2 – x + 5$ to obtain a polynomial which is exactly divisible by x + 5?

7. If the polynomials $px^3 + 4x^2 + 3x – 4$ and $x^3 – 4x + p$ are divided by x – 3 then the remainder in each case is the same. Find the value of p.

8. If $x^3 + px^2 + qx + 6$ leaves remainder 3 when divided by x – 3 and 0 when divided by x – 2 Find the values of p and q.

9. If $2x^3 + ax^2 + bx – 6$ has x – 1 as a factor and leaves a remainder 2 when divided by x – 2 , find the value of a and b.

10. Factorise $x^3 – 3x^2 – 10x + 24$ given that x – 2 is a factor.

11. Find the value of $a^3 + b^3 + c^3 – 3abc$, if a + b + c = 14 and $a^2 + b^2 + c^2 = 60$.

12. If a + b + c = 0, then prove that $\frac{a^2}{bc} + \frac{b^2}{ca} + \frac{c^2}{ab} = 3$

13. Factorise: $(2x – 3y)^3 + (3y – z)^3 + (z – 2x)^3$

14. Prove that: $a^3 – 8b^3 + 27c^3 + 18abc = 0$ when a + 3c = 2b

15. If $x + \frac{1}{x} = 5$, evaluate $x^4 + \frac{1}{x^4}$.