

**INTERNATIONAL INDIAN SCHOOL, RIYADH**

**CLASS: X**

**SUBJECT: MATHEMATICS**

**TOPIC: POLYNOMIALS**

1. Show that  $x^2 - 3$  is a factor of  $2x^4 + 3x^3 - 2x^2 - 9x - 12$
2. Divide  $(6 + 19x + x^2 - 6x^3)$  by  $(2 + 5x - 3x^2)$  and verify the division algorithm
3. Find other zeroes of the polynomial  $p(x) = 2x^4 + 7x^3 - 19x^2 - 14x + 30$  if two of its zeroes are  $\sqrt{2}$  and  $-\sqrt{2}$  (3/2, -5)
4. Find all the zeroes of  $2x^4 - 9x^3 + 5x^2 + 3x - 1$ , if two of its zeroes are  $2 + \sqrt{3}$  and  $2 - \sqrt{3}$  (1, -1/2)
5. Find all the zeroes of polynomial  $4x^4 - 20x^3 + 23x^2 + 5x - 6$  if two of its zeroes are 2 and 3 (1/2, -1/2)
6. When a polynomial  $f(x)$  is divided by  $x^2 - 5$  the quotient is  $x^2 - 2x - 3$  and remainder is zero. Find the polynomial and all its zeroes (3, -1,  $\sqrt{5}$ ,  $-\sqrt{5}$ )
7. If the polynomial  $f(x) = x^4 - 6x^3 + 16x^2 - 25x + 10$ , is divided by another polynomial  $x^2 - 2x + k$  the remainder comes out to be  $x + a$ , Find  $k$  and  $a$  ( $k = 5$ ,  $a = -5$ )
8. On dividing  $x^3 - 3x^2 + x + 2$  by a polynomial  $g(x)$ , the quotient and remainder were  $x - 2$  and  $-2x + 4$ , respectively. Find  $g(x)$  ( $x^2 - x + 1$ )
9. If the polynomial  $6x^4 + 8x^3 - 5x^2 + ax + b$  is exactly divisible by the polynomial  $2x^2 - 5$ , then find the values of  $a$  and  $b$  (-20, -25)
10. What must be subtracted from  $2x^4 - 11x^3 + 29x^2 - 40x + 29$ , so that the resulting polynomial is exactly divisible by  $x^2 - 3x + 4$  (-2x + 5)
11. Find the polynomial, whose zeroes are  $2 + \sqrt{3}$  and  $2 - \sqrt{3}$  ( $x^2 - 4x + 1$ )
12. Form a quadratic polynomial, one of whose zero is  $2 + \sqrt{5}$  and the sum of zeroes is 4 ( $x^2 - 4x - 1$ )
13. Find a quadratic polynomial whose sum and product of the zeroes are  $21/8$  and  $5/16$  ( $16x^2 - 42x + 5$ )
14. Write a quadratic polynomial, the sum and product of whose zeroes are 3 and -2 ( $x^2 - 3x - 2$ )
15. Find the zeroes of the polynomial and verify the relationship between the zeroes and the coefficient
  - a)  $4x^2 - 7$
  - b)  $\sqrt{3}x^2 - 8x + 4\sqrt{3}$
16. If one root of the polynomial  $5x^3 + 13x + k$  is reciprocal of the other, then find the value of  $k$ ? ( $k = 5$ )
17. If one zero of the polynomial  $(a^2 + 9)x^2 + 13x + 6a$  is reciprocal of the other. Find the value of  $a$  (3)
18. If  $\alpha$  and  $\beta$  are the zeroes of the polynomial  $f(x) = 6x^2 + x - 2$ , find the value of  $\frac{1}{\alpha} + \frac{1}{\beta} - \alpha\beta$  (5/6)
19. If  $\alpha$  and  $\beta$  are the zeroes of the polynomial  $f(x) = x^2 - 8x + k$  such that  $\alpha^2 + \beta^2 = 40$ , find  $k$  (12)
20. If  $\alpha, \beta$  are the zeroes of a polynomial, such that  $\alpha + \beta = 6$  and  $\alpha\beta = 4$ , then write the polynomial
21. If the product of zeroes of the polynomial  $ax^2 - 6x - 6$  is 4, find the value of  $a$  (-3/2)
22. If  $\alpha, \beta$  are the zeroes of quadratic polynomial  $2x^2 + 5x + k$ , find the value of  $k$  such that  $(\alpha + \beta)^2 - \alpha\beta = 24$  (-71/2)
23. If  $\alpha$  and  $\beta$  are zeroes of  $x^2 + 5x + 5$ , find the value of  $\alpha^{-1} + \beta^{-1}$  (-1)
24.  $\alpha, \beta$  are the zeroes of the quadratic polynomial  $x^2 - (k+6)x + 2(2k-1)$ . Find the value of  $k$  if  $\alpha + \beta = \frac{1}{2}\alpha\beta$  (7)
25. If  $\alpha, \beta$  are the zeroes of the quadratic polynomial  $x^2 - 7x + 10$ , find the value of  $\alpha^3 + \beta^3$  (133)
26.  $m, n$  are zeroes of  $ax^2 - 12x + c$ . Find the value of  $a$  and  $c$  if  $m + n = m n = 3$  (12)
27. Find the sum and the product of the zeroes of cubic polynomial  $2x^3 - 5x^2 - 14x + 8$  (5/2, -7, -4)
28. Find the sum and product of the zeroes of quadratic polynomial  $x^2 - 3$
29. If 1 is a zero of polynomial  $ax^2 - 3(a-1)x - 1$ , then find the value of  $a$  (1)

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