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Holiday Homework

Class: X **Subject: Mathematics**

1. Find the zeroes of the following quadratic polynomials and verify the relationship between the zeroes and the coefficients.
   (i) $5x^2 - 29x + 20$ (ii) $x^2 - 5x$
2. Form the quadratic polynomials whose zeroes are (i) $3 \pm \sqrt{2}$ (ii) $-\sqrt{2}$ and $\sqrt{2}$
3. Find all the zeroes of $x^3 + 6x^2 + 11x + 6$ if $(x+1)$ is a factor.
4. Find the all the zeroes of $x^3 - 10x^2 + 31x - 30$ if 2 is a zero of it.
5. Find the values of 'a' and 'b', if 2 and 3 are zeroes of $x^3 + ax^2 + bx - 30$
6. Divide $x^4 - 4x^3 + 8x^2 + 7x + 10$ by $(x-2)$ and verify the division algorithm.
7. Find the value of 'k', if $(x-2)$ is a factor of $x^2 - kx + 10$.
8. Find the value of 'm', if 2 is a zero of $3x^2 - 17x + m$.
9. Find the all the zeroes of $4x^4 - 20x^3 + 23x^2 + 5x - 6$ if two of its zeroes are 2 and 3.
10. If α and β are the zeroes of $x^2 + 5x + 6$, find the value of $\alpha^{-1} + \beta^{-1}$.
11. If $\frac{1}{2}$ and 1 are the zeroes of $2x^4 - 3x^3 - 3x^2 + 6x - 2$, find the other zeroes.
12. If one of the zeroes of the polynomial $5z^2 + 13z - p$ is the reciprocal of the other, find 'p'.
13. On dividing the polynomial $4x^4 - 3x^3 - 42x^2 - 55x - 17$ by the polynomial $g(x)$ the quotient is $x^2 - 3x - 5$ and the remainder is $5x + 8$. Find $g(x)$.
14. Verify that 1, 2 and $\frac{1}{2}$ are zeroes of $2x^3 + x^2 - 5x + 2$. Also, verify the relationship between the zeroes and the coefficients.
15. If α and β are the zeroes of the quadratic polynomial $x^2 - kx + 15$ such that $(\alpha + \beta)^2 - 2\alpha\beta = 34$, find '$k$'.
16. If one zero of polynomial $2x^2 - 3x + p$ is 3, then find the other root. Also, find the value of 'p'.
17. If α and β are the zeroes of the quadratic polynomial $ax^2 + bx + c$, find the value of $\frac{1}{\alpha}$ and $\frac{1}{\beta}$.
18. If α and β are the zeroes of $2x^2 - 9x + 10$, form the polynomial whose zeroes are $\frac{1}{\alpha}$ and $\frac{1}{\beta}$.
19. The curve which represents a quadratic polynomial meets the X-axis at (2, 0) and (– 2, 0). Form the quadratic polynomial.
20. Find the values of 'a' and 'b' such that $x^4 + x^3 + 8x^2 + ax + b$ is exactly divisible by $x^2 + 1$.
21. If the polynomial $p(x) = x^4 - 6x^3 + 16x^2 - 25x + 10$ divided by $x^2 - 2x + k$, the remainder is $x + a$. Find 'k' and 'a'.
22. The zeroes of $x^2 - kx + 6$ are in the ratio 3:2, find 'k'.
23. What must be subtracted from $8x^4 + 14x^3 - 2x^2 + 7x - 8$ so that the resulting polynomial is exactly divisible by $4x^2 + 3x - 2$?
24. What must be added to $4x^4 + 2x^3 - 2x^2 + x - 1$ so that the resulting polynomial is exactly divisible by $x^2 + 2x - 3$?
25. Divide $2x^2 + 4x^3 + 5x - 6$ by $2x^2 + 1 + 3x$ and verify the division algorithm.