Maths Work Sheet

Class - X

Chapter: - Polynomials

Q01 :} Find the Zeroes of the following quadratic polynomials and verify the relationship between the zeroes and the coefficients:

a) \(5x^2 - 29x + 20\)
b) \(2\sqrt{2}x^2 - 9x + 5\sqrt{2}\)
c) \(3\sqrt{3}x^2 - 19x + 10\sqrt{3}\)
d) \(x^2 - x - 72\)
e) \(x^2 - 2\)
f) \(x^2 - 5x\)
g) \(x^2 - 9\)

Q02 :} Form the Quadratic polynomials whose zeros are:

a) \(3 \pm \sqrt{2}\)
b) \(-\sqrt{2}\) and \(\sqrt{2}\)
c) \(\frac{1}{3}\) and \(\frac{1}{4}\)
d) \(-5\) and \(-3\)
e) \(3\) and \(\frac{1}{5}\)
f) \(\frac{1}{a}\) , \(\frac{1}{b}\)

Q03 :} Find all the Zeroes of \(x^3 + 6x^2 + 11x + 6\) if \((x + 1)\) is a factor.

Q04 :} Find all the Zeroes of \(x^3 - 10x^2 + 31x - 30\) if 2 is a zero of it.

Q05 :} Find the values of \(a\) and \(b\), if 2 and 3 are zeroes of \(x^3 + ax^2 + bx - 30\).

Q06 :} Divide \(x^4 - 4x^3 + 8x^2 + 7x + 10\) by \((x - 2)\) and verify the division algorithm.

Q07 :} Find the value of \(k\) if \((x - 2)\) is a factor of \(x^2 - kx + 10\).

Q08 :} Find the value of \(k\) if 2 is zero of \(3x^2 - 17x + k\).

Q09 :} Find all the zeroes of \(4x^4 - 20x^3 + 23x^2 + 5x - 6\) if two of its zeroes are 2 & 3.

Q10 :} If \(\alpha\) and \(\beta\) are the zeroes of \(x^2 + 5x + 6\) find the value of \(\alpha^{-1} + \beta^{-1}\).

Q11 :} If \(\frac{1}{2}\) and 1 are zeroes of \(2x^4 - 3x^3 - 3x^2 + 6x - 2\), find the other zeroes.
Q12 :} If $-5$ and $7$ are zeroes of $x^4 - 6x^3 - 26x^2 + 138x - 35$ find the other zeroes.

Q13 :} If one of the zeroes of the polynomial $5z^2 + 13z - p$ is the reciprocal of the other, find $p$.

Q14 :} 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 $g(x)$.

Q15 :} If $\frac{1}{2}$ and $1$ are zeroes of $2x^4 - 3x^3 - 3x^2 + 6x - 2$, find the other zeroes.

Q16 :} 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.

Q17 :} If $\alpha$ and $\beta$ are the zeroes of quadratic polynomial $x^2 - kx + 15$ such that $(\alpha + \beta)^2 - 2\alpha\beta = 34$, find $k$.

Q18 :} If one zero of polynomial $2x^2 - 3x + p$ is $3$, then find the other root(zero). Also find the value of $p$.

Q19 :} If one zero of polynomial $2x^2 + px + 4$ is $2$, find the other zero. Also find $p$.

Q20 :} If $\alpha$ and $\beta$ are the zeroes of the quadratic polynomial $ax^2 + bx + c$, find the value of $\frac{1}{\alpha} + \frac{1}{\beta}$.

Q21 :} If one zero of the polynomial $(a^2 + 9)x^2 + 13x + 6\alpha$ is the reciprocal of the other, find $\alpha$.

Q22 :} If $\alpha$ and $\beta$ are the zeroes of $2x^2 - 9x + 10$, form the polynomial whose zeroes are $\frac{1}{\alpha}$ and $\frac{1}{\beta}$.

Q23 :} Divide $2x^2 + 4x^3 + 5x - 6$ by $2x^2 + 1 + 3x$ and verify the division algorithm.

Q24 :} The curve which represents a quadratic polynomial meets the $x$ axis at $(2, 0)$ and $(-2, 0)$. Form the quadratic polynomial.

Q25 :} What must be subtracted from $8x^4 + 14x^3 - 2x^2 + 7x - 8$, so that the difference is exactly divisible by $4x^2 + 3x - 2$?

Q26 :} Find the values of $a$ and $b$ such that $x^4 + x^3 + 8x^2 + ax + b$ is exactly divisible by $x^2 + 1$?
**Q27 :** 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 \( a \).

**Q28 :** The zeroes of \( x^2 - kx + 6 \) are in the ratio 3:2, find \( k \).