Polynomials

WORKSHEET

Problem – 1.

Is $2-\sqrt{3}x+5x^2$ a polynomial or not?

Sol.

Problem – 2.

Write the zeros of the polynomial $x^2 - 5x + 6$.

Sol.

Problem – 3.

If α and β are the zeros of $x^2 + 5x + 12$, then what is the value of $\alpha\beta$?

Sol.

Problem – 4.

Find the quadratic polynomial, whose zeros are $\frac{5}{3}$ and $\frac{-3}{2}$.

Sol.

Problem – 5.

If the sum of the zeros of the polynomial $f(x) = 2x^3 - kx^2 + 4x - 5$ is 6, then what is the value of k?

Sol.

Problem – 6.

Can $x-1$ be the remainder on division of a polynomial $P(x)$ by $x+3$?

Sol.

Problem – 7.

What is the sum of the zeros of the polynomial $4x^2 - 16x + 12$?

Sol.

Problem – 8.

If one zero of the quadratic polynomial $P(x) = x^2 + 4kx - 25$ is negative of the other, find the value of k.

Sol.

Problem – 9.

If α, β are the zeros of the polynomial $f(x) = ax^2 + bx + c$, then find $\frac{1}{\alpha^2} + \frac{1}{\beta^2}$.

Sol.

Problem – 10.

If 1 is the zero of the quadratic polynomial $x^2 + kx - 5$, then find the value of k.

Sol.

Problem – 11.

If one root of the polynomial $f(x) = x^2 + 5x + k$ is reciprocal of the other, find the value of k.

Sol.

Problem – 12.

Find the zeros of the linear polynomial $y = 2x - 7$ graphically.

Sol.

Problem – 13.

If α, β are the zeros of $f(x) = px^2 - 2x + 3p$ and $\alpha + \beta = \alpha\beta$, then find the value of p.

Sol.

Problem – 14.

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

Sol.

Problem – 15.

If $(x+b)$ is a factor of $2x^2+2bx+5x+10$, find b.

Sol.

Problem – 16.

If the product of zeros of the polynomial $ax^2 - 6x - 6$ is 4, find the value of a.

Sol.

Problem – 17.

If α and β are the zeros of the quadratic polynomial $p(t) = t^2 - 5t - 1$, find the value of $\frac{\alpha^2}{\beta^2} + \frac{\beta^2}{\alpha^2} + 2\left(\frac{\alpha}{\beta} + \frac{\beta}{\alpha}\right) - \alpha\beta$.

Sol.

Problem – 18.

If α and β are the zeros of the polynomial $x^2 - 5x + 6$, find a polynomial whose zeros are $2\alpha - 1$ and $2\beta - 1$.

Sol.

Problem – 19.

Divide the polynomial $2x^2 + 3x + 1$ by the polynomial $x + 2$ and verify the division algorithm.

Sol.

Problem – 20.

If α and β are the zeros of the quadratic polynomial $f(x) = 2x^2 - 5x + 7$, find a polynomial whose zeros are $2\alpha + 3\beta$ and $3\alpha + 2\beta$.

Sol.

Problem – 21.

Check whether the polynomial $g(x) = x^2 - 2$ is a factor of the polynomial $f(x) = x^4 + x^3 + x^2 - 2x - 3$ by applying division algorithm.

Sol.

Problem – 22.

If α and β are the zeros of the quadratic polynomial $f(t) = t^2 - p(t+1) - a$, show that $(\alpha+1)(\beta+1) = 1 - a$.

Sol.

Problem – 23.

If $(x-2)$ is a factor of $x^3+ax^2+bx+16$ and $b=4a$, find the values of a and b.

Sol.

Problem – 24.

If the zeros of the quadratic polynomial $x^2 + (a+1)x + b$ are 2 and –3, then find a and b.

Sol.

Problem – 25.

Check whether the polynomial $t^2 - 3$ is a factor of the polynomial $2t^4 + 3t^3 - 2t^2 - 9t - 12$, by dividing the second polynomial by the first polynomial.

Sol.

Problem – 26.

Find all the zeros of $2x^4 - 3x^3 - 3x^2 + 6x - 2$, if you know that two of its zeros are $\sqrt{2}$ and $-\sqrt{2}$.

Sol.

Problem – 27.

Find all the zeros of the polynomial $f(x) = 2x^4 - 3x^3 - 5x^2 + 9x - 3$, it being given that two of its zeros are $\sqrt{3}$ and $-\sqrt{3}$.

Sol.

Problem – 28.

If the polynomial $x^4 - 6x^3 + 16x^2 - 25x + 10$ is divided by another polynomial $x^2 - 2x + k$, the remainder comes out to be $x + a$, find k and a.

Sol.

Problem – 29.

If $\sqrt{2}$ is a zero of the cubic polynomial $6x^3 + \sqrt{2}x^2 - 10x - 4\sqrt{2}$, then find its other two zeros.

Sol.

Problem – 30.

If $x = \sqrt{5}$ is a factor of the cubic polynomial $x^3 - 3\sqrt{5}x^2 + 13x - 3\sqrt{5}$, then find all the zeros of the polynomial.

Sol.

Sol.