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परमाणु ऊर्जा शिक्षा संस्था , मुंबई

Atomic Energy Education Society, Mumbai

Session : 2023 – 24

Class: X **Subject: MATHEMATICS**

WORKSHEET NO.- 1

Name of the Chapter : POLYNOMIALS(CHAPTER – 2)

General Instructions:

1. There are 5 sections in this worksheet.
2. Section – A has 10 multiple choice questions of 1 mark each.
3. Section – B has 10 very short answer questions of 1 mark each.
4. Section – C has 10 short answer questions of 2 marks each.
5. Section – D has 5 short answer questions of 3 marks each.
6. Section – E has 5 long answer questions of 5 marks each.
7. Draw neat diagrams wherever necessary.
8. Use of calculator is not permitted.

Section A

1 The zeros of the polynomial $x^2 - 2x - 3$ are **[1]**

a) $-3, 1$

b) $3, -1$

c) $3, 1$

d) $-3, -1$

2 The sum and the product of the zeros of a quadratic polynomial are 3 and - 10 respectively. The quadratic polynomial is **[1]**

a) $x^2 - 3x + 10$

b) $x^2 - 3x - 10$

c) $x^2 + 3x - 10$

d) $x^2 + 3x + 10$

3 The zeros of the quadratic polynomial $x^2 + 88x + 125$ are **[1]**

a) both negative

b) both positive

c) both equal

d) one positive and one negative

4 If α and β are the zeroes of the polynomial $2x^2 + 5x + 1$, then the value of $\alpha + \beta + \alpha\beta$ is **[1]**

a) - 2

b) 3

c) - 1

d) 1

5 If α and β are the zeros of the polynomialf(x) $=x^2$ +px+q, then a polynomial having $\frac{1}{\alpha} and \frac{1}{\beta}$ is its zero is **[1]**

a) qx^2 +px+ 1

b) x^2 +qx+p

c) x^2 - px+q

d) px^2 +qx+ 1

6 If α and β are the zeros of $2x^2 + 5x - 9$ then the value of $\alpha\beta$ is **[1]**

a) $\frac{-9}{2}$

b) $\frac{9}{2}$

c) $\frac{5}{2}$

d) $\frac{-5}{2}$

7 If α , β are the zeros of the polynomial $f(x) = x^2 + x + 1$, then $\frac{1}{\alpha} + \frac{1}{\beta} =$ **[1]**

a) - 1

b) 1

c) None of these

d) 0

8 If α , β are the zeros of the polynomial $p(x) = 4x^2 + 3x + 7$, then $\frac{1}{\alpha} + \frac{1}{\beta}$ is equal to **[1]**

a) $\frac{3}{7}$

b) $-\frac{3}{7}$

c) $-\frac{7}{3}$

d) $\frac{7}{3}$

9 The number polynomials having zeroes as – 2 and 5 is **[1]**

a) 1

b) 2

c) 3

d) more than 3

10 If one of the zeroes of the quadratic polynomial $14x^2 - 42k^2 x - 9$ is negative of the other, then the value of kis **[1]**

a) 3

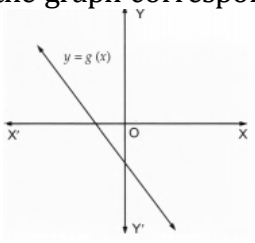
b) 0

c) 1

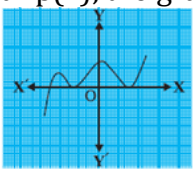
d) 2

Section – B

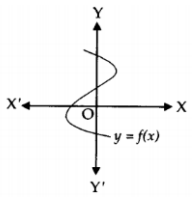
11 Identify that the graph corresponds to a linear polynomial or a quadratic polynomial?? **[1]**



12 For a polynomial p(x), the graph of y = p(x) isgiven below. Find the number of zeroes of p(x). **[1]**



13 In the adjoining figure, the graph of f(x) is drawn. Find the number of zeroes of **[1]**



f(x).

14 If the sum of the zeros of the quadratic polynomial $f(t) = kt^2 + 2t + 3k$ is equal to their product, find the value of k. **[1]**

15 Write the zeros of the quadratic polynomial $f(x) = 6x^2 - 3$. **[1]**

16 Finda quadratic polynomial whose zeroes are 3 and - 5. **[1]**

17 Write a quadratic polynomial, the sum and product of whose zeroes are 3 and - 2. **[1]**

18 If the sum and the product of the zeroes of a quadratic polynomial are $-\frac{1}{2}$ and $\frac{1}{2}$ respectively, then find the polynomial. **[1]**

19 Find the sum and product of zeroes of the polynomial $p(x) = x^2 + 5x + 6$. **[1]**

20 If the product of zeros of the quadratic polynomial $f(x) = x^2 - 4x + k$ is 3, find the value of k. **[1]**

Section – C

21 A teacher after teaching the chapter polynomial in class 10th wrote the sum and product of zeros respectively on the blackboard to test the skill grasped by his students. Find out the Polynomials that the teacher have in his mind. **[2]**

1. 0 and $\sqrt{2}$
2. $2 + \sqrt{3}$ and $2 - \sqrt{3}$
3. $2\sqrt{5}$ and $-\sqrt{5}$
4. $\frac{3}{2}$ and $-\frac{1}{2}$

22 If α and β are the zeroes of the quadratic polynomial $x^2 - 5x + 6$, find the value of $\frac{1}{\alpha} + \frac{1}{\beta} - 2\alpha\beta$. **[2]**

23 Find a quadratic polynomial whose one zero is 5 and product of zeroes is 30. **[2]**

24 Find the zeroes of thepolynomial$4x^2 - 3x - 1$ by factorisation method and verify the relationbetween the zeroand the coefficient of the polynomial. **[2]**

25 If the graph of quadratic polynomial$ax^2 + bx + c$cuts negative direction ofy - axis, then what is the sign ofc? **[2]**

26 Show that the polynomial $f(x) = x^4 + 4x^2 + 6$ has no realzero. **[2]**

27 If α and β are the zeros of the quadratic polynomial $f(x) = ax^2 + bx + c$, then evaluate:1/aα+b+1/aβ+b **[2]**

28 If α, β are zeroes of quadratic polynomial $2x^2 + 5x + k$, find the value of k such that $(\alpha + \beta)^2 - \alpha\beta = 24$. **[2]**

29 If α and β are the zeroes of the polynomial $f(x) = x^2 - 4x - 5$, then find the value **[2]**

of $\alpha^2 + \beta^2$

30 Find the zeroes of thepolynomial$5t^2$ + 12t + 7 by factorization method and verify the relationbetween the zeroand the coefficientof the polynomial. **[2]**

Section – D

31 Find the quadratic polynomial, sum and product of whose zeroes are –1 and – 20 respectively. Also find the zeroes of the polynomial so obtained. **[3]**

32 Ifα and β are the zeros of the polynomial f(x) = x^2 - 5x + k such that $\alpha - \beta = 1$, find the value of k. **[3]**

33 Ifα and β are zeroes of the quadratic polynomial $4x^2$ + 4x+ 1, then form a quadratic polynomial whose zeroes are 2 α and 2 β . **[3]**

34 Find the zeroes of the polynomial $2s^2 + (1 + 2\sqrt{2})s + \sqrt{2}$ by factorisation method and verify the relationship between the zeroes and coefficient of the polynomial. **[3]**

35 Find the zeroes of the quadratic polynomial $4y^2$ – 15 and verify the relationship between the zeroes and coefficient of polynomial. **[3]**

Section – E

36 Find the zeros of $f(v) = v^2 + 4\sqrt{3}v - 15$ and verify the relationship between the zeros and its coefficients. **[5]**

37 Ifα and β are the zeros of the quadratic polynomial f(x) = ax^2 + bx + c, then evaluate: $a\left(\frac{\alpha^2}{\beta} + \frac{\beta^2}{\alpha}\right) + b\left(\frac{\alpha}{\beta} + \frac{\beta}{\alpha}\right)$ **[5]**

38 Find the zeros of $q(y) = 7y^2 - \frac{11}{3}y - \frac{2}{3}$ and verify the relationship between the zeros and its coefficients. **[5]**

39 Ifα and β are the zeroes of the polynomial x^2 + 4x + 3, find the polynomial whose zeroes are $1 + \frac{\beta}{\alpha} and 1 + \frac{\alpha}{\beta}$. . **[5]**

40 Ifβ and $\frac{1}{\beta}$ are zeroes of the polynomial ($\alpha^2 + \alpha$)x^2 + 61x + 6 α . Find the values of β and α . **[5]**