DAV SCHOOL, DHURWA
SECTOR – III: RANCHI – 4
SUMMER ASSIGNMENT – 2020-21
Subject: MATHS
CLASS – X

Recommended Book: Secondary School Mathematics (R.S. Agarwal)

I. Find the zeros of the following quadratic polynomials and verify the relationship between the zeros and the coefficients.

1. $4x^2 + 4x^2 - 3$
2. $5x^2 - 4 - 8x$
3. $2\sqrt{3x^2} - 5x + \sqrt{3}$
4. *Find the quadratic polynomial, sum of whose zeros is 8 and their product is 12. Hence find the zeros of the polynomial.*
5. *If* $x = \frac{2}{3}$ *and* $x = -3x$ *are the roots of the quadratic equation ax2 + 7x +b = 0, then find the values of a and b.*
6. $If\ (x + a) is\ a\ factor\ of\ the\ polynomial\ 2x^2 + 2ax + 5x + 10, find\ the\ value\ of\ x?$
7. *Find all the zero of* $2x^4 - 3x^3 - 5x^2 + 9x - 3$ *it being given that two of its zeros are* $\sqrt{3}\ and\ -\sqrt{3}$.
8. *If 2 and -2 are two zeros of the polynomial* $x^4 + x^3 - 34x^2 - 4x + 120$, *find all the zeros of the given polynomial.*
9. *Find all the zeros of* $x^4 + x^3 - 23x^2 - 3x + 60$, *if it is given that two of its zeros are* $\sqrt{3}\ and\ -\sqrt{3}$.
10. $If\ one\ zero\ of\ the\ polynomial\ x^2 - 4x + 1\ is\ (2 + \sqrt{3}), write\ the\ other\ one.$
11. $Find\ the\ zeros\ of\ the\ polynomial\ (x^2 + x - p(p + 1).$
12. $Find\ the\ zeros\ of\ the\ polynomial\ (x^2 - 3x - m\ (m + 3).$
13. *If* $\alpha, \beta$ *are the zeros of a polynomial such that* $\alpha + \beta = 6$ *and* $\alpha\beta = 4$, *then write the polynomial.*
14. *If 3 is a zero of the polynomial* $(2x^2 + x + k$, *find the value of K.*

II. Solve for x and y:

15. $x + \frac{6}{y} = 6, 3x - \frac{8}{y} = 5(y \neq 0)$
16. $71x + 37y = 253,\ 37x + 71y = 287$
17. $\frac{x}{a} + \frac{y}{b} = 2, ax - by = a - b^2$
18. $ax - by = a^2 + b^2, x + y = 2a$

III. Find the value of 'k' for which each of the following systems of linear equations has an infinite number of solutions :

19. $2x + 3y = 7,\ (k-1)x + (k+2)y = 3k$
20. $2x + (k-2)y = k,\ 6x + (2k-1)y = (2k+5)$
21. $kx + 3y = 2k + 1,\ 2(k+1)x + 9y = (7k+1)$
22. $5x + 2y = 2k,\ 2(k+1)x + ky = (3k+4)$
23. $(k-1)x - y = 5,\ (k+1)x + (1-k)y = (3k+1)$
24. $(k-3)x + 3y = k,\ kx + ky = 12$
25. The sum of a two digit number and the number obtained by reversing the order of its digits is 99. If the digits differ by 3, find the number.
26. A two digit number is such that the product of its digits is 14. If 45 is added to the number, the digits interchange their places. Find the number.
27. A two digit number is four times the sum of its digits and twice the product of its digits. Find the number.
28. Solve each of the following quadratic equations:
    i. $2x^2 + \text{ax} - a^2 = 0$
    ii. $4x^2 + 4bx - (a^2 - b^2) = 0$
    iii. $\frac{3}{x+1} - \frac{1}{2} = \frac{2}{3x-1}, x \neq -1, \frac{1}{3}$
    iv. $\frac{1}{x+1} + \frac{2}{x+2} = \frac{5}{x+4}, x \neq -1, -2, -4$

29. Find the roots of each of the following equations, if they exist, by applying the quadratic formula:
    i. $\sqrt{2x^2} + 7x + 5\sqrt{2} = 0$
    ii. $x^2 + 6x - (a^2 + 2a - 8) = 0$
    iii. $x^2 + 5x - (a^2 + a - 6) = 0$
30. For what values of K are the roots of the quadratic equation $3x^2 + 2kx + 27 = 0$ real and equal
31. For what values of p are the roots of the quadratic equation $4x^2 + px + 3 = 0$ real and equal?

IV. CHAPTER 3 – LINEAR EQUATION IN TWO VARIABLE

1. Solve the following system of linear equations graphically:
   $4x - 5y - 20 = 0\ and\ 3x = 5y - 15 = 0$
   Determine the vertices of the triangle formed by the lines representing the above equations and the y-axis.
2. Solve the following system of equations graphically.
   $3x + 2y - 11 = 0\ and\ 2x - 3y + 10 = 0$
   Shade the region bounded by these lines and the x-axis.