

परमाणु ऊर्जा शिक्षा संस्था , मुंबई

Atomic Energy Education Society, Mumbai

Session : 2023 – 24

Class: X

Subject: MATHEMATICS

WORKSHEET NO.- 1

Name of the Chapter : PAIRS OF LINEAR EQUATIONS IN TWO VARIABLES
(CHAPTER – 3)

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 X 10=10)

1. The solution to a pair of linear equations is the point of intersection of their:
a) Graphs b) Parallel lines c) Perpendicular lines d) None of the above
2. If the lines represented by two linear equations are parallel, how many solutions do they have?
a) No solution b) One solution c) Infinitely many solutions d) Cannot be determined
3. The system of equations: $2x - 3y = 7$ and $4x - 6y = 14$ has:
a) A unique solution b) No solution c) Infinitely many solutions d) None of the above
4. The solution to the equations $3x - 5y = 12$ and $6x - 10y = 24$ is:
a) (3, 1) b) (4, 0) c) (2, 2) d) (5, -1)
5. Two lines are perpendicular if the product of their slopes is:
a) -1 b) 0 c) 1 d) Undefined
6. If a pair of linear equations has no solution, the lines are:
a) Intersecting b) Coincident c) Parallel d) None of the above
7. The solution of the pair of equations $2x + 3y = 8$ and $4x + 6y = 16$ is:
a) (2, 2) b) (1, 2) c) (2, 1) d) (3, 2)
8. In a pair of linear equations, if the lines are coincident, they have:

- a) No solution b) Infinite solutions c) One solution d) Two solutions
9. The pair of equations $x + y = 5$ and $2x + 2y = 10$ represents:
- a) A unique solution b) No solution c) Infinitely many solutions d) None of the above
10. The lines represented by the equations $3x - 2y = 7$ and $6x - 4y = 14$ are:
- a) Parallel b) Perpendicular c) Coincident d) None of these

SECTION – B (1 X 10=10)

11. Define a pair of linear equations in two variables.
12. What is meant by the graphical solution of a pair of linear equations?
13. Write the condition for a pair of linear equations to have no solution.
14. Solve the system of equations: $3x - 2y = 5$ and $2x + y = 4$.
15. Find the value of 'k' if the pair of equations $kx - y = 3$ and $2x - ky = 4$ has a unique solution.
16. Explain why the pair of equations $2x + 3y = 7$ and $4x + 6y = 14$ has infinitely many solutions.
17. Solve the system of equations graphically: $2x + y = 5$ and $x - y = 1$.
18. Determine the value of 'a' for which the lines represented by the equations $3x - 2y = a$ and $6x - 4y = 2a$ are coincident.
19. If two lines are perpendicular, what is the relationship between their slopes?
20. Verify whether the point (2, 3) is a solution to the equation $4x - 2y = 8$.

SECTION – C (2 X 10 =20)

21. Solve the system of equations: $2x + y = 7$ and $3x - 2y = 1$.
22. Determine the value of 'p' for which the lines represented by the equations $px - y = 4$ and $2x - 2py = 8$ are parallel.
23. Graphically solve the system of equations: $3x - 2y = 6$ and $2x + 3y = 9$.
24. Solve the following pair of equations using the substitution method: $4x - 3y = 5$ and $2x + y = 1$
25. Solve the system of equations algebraically and graphically: $x - 2y = 3$ and $2x + 3y = 8$.
26. Solve the following system of equations graphically: $2x - 3y = 6$, $x + 2y = 4$
27. Find the values of p and q if the lines $px + qy = 7$ and $2x - 3y = 4$ are parallel.
28. Solve the system of equations using the substitution method: $3x - 2y = 8$ and $x + y = 4$
29. Determine the values of a and b if the lines $3x + 2y = 10$ and $ax + by = 5$ are perpendicular to each other.

30. Solve the system of equations using the elimination method: $2x-3y=5$ $4x+y=9$

SECTION – D (3 X 5 =15)

31. A pair of linear equations is given by: $3x + 2y = 8$ and $2x - 3y = 1$. Determine the values of 'x' and 'y' that satisfy both equations.
32. The ages of two friends, A and B, have a sum of 40 years. A is 4 years older than B. Write a pair of linear equations to represent this situation and solve it graphically.
33. Solve the following system of equations using the elimination method: $2x + 3y = 7$ $4x - 5y = 11$
34. A sum of money amounts to Rs. 9800. If it is invested in two types of shares, one yielding 9% and the other 11% per annum, resulting in an annual income of Rs. 900. Find the amount invested in each share.
35. The ages of two friends, A and B, are such that the sum of their ages is 40 years. Five years ago, the age of A was three times that of B. Find their present ages.

SECTION – E (5 X 5 =25)

36. The sum of the digits of a two-digit number is 8. If the tens digit is multiplied by 3 and the ones digit by 5, the resulting number is 29 more than the original number. Find the original number using a pair of linear equations.
37. A boat can travel 28 km upstream in the same time it takes to travel 42 km downstream. If the speed of the stream is 4 km/h, find the speed of the boat in still water.
38. The difference between two numbers is 6, and their sum is 18. Find the numbers using a pair of linear equations.
39. The perimeter of a rectangle is 50 cm. Its length is 15 cm more than its width. Find the dimensions of the rectangle using a pair of linear equations.
40. A sum of money is divided between A and B in the ratio 3:5. If A's share is Rs. 1800, find the total sum of money and B's share using a pair of linear equations.
