In this worksheet you will learn to solve systems of two equations in two variables using effective methods such as substitution and elimination. Work through the problems carefully and check your solutions.

Easy Questions

1. Solve the system $\begin{cases} x + y = 5 \\ x - y = 1 \end{cases}$.

2. Solve the system $\begin{cases} y = 2x + 1 \\ x + y = 7 \end{cases}$.

3. Solve the system $\begin{cases} 2x + 3y = 13 \\ 4x + 6y = 26 \end{cases}$. (Hint: The second equation is a multiple of the first.)

4. Solve the system $\begin{cases} 3x - y = 2 \\ x + y = 6 \end{cases}$.

5. Two numbers have a sum of 10 and a difference of 2. Formulate and solve the system of equations to find the numbers.

Intermediate Questions

6. Solve the system $\begin{cases} 2x + 3y = 12 \\ 5x - y = 9 \end{cases}$.

7. Solve the system $\begin{cases} y = x - 1 \\ 3x + 2y = 14 \end{cases}$.

8. Solve the system $\begin{cases} x + 2y = 5 \\ 3x - y = 4 \end{cases}$.

9. Solve the system $\begin{cases} 4x + 5y = 2 \\ 2x - y = 7 \end{cases}$.

10. Solve the system $\begin{cases} 3(x + y) = 18 \\ 2x - y = 3 \end{cases}$.

11. Solve the system $\begin{cases} x - y = 0 \\ 2x + 3y = 20 \end{cases}$.

12. Solve the system $\begin{cases} 5x + 2y = 1 \\ 3x - 4y = -9 \end{cases}$.

13. Solve the system $\begin{cases} \frac{x}{2} + y = 4 \\ x - \frac{y}{3} = 5 \end{cases}$.

14. Solve the system $\begin{cases} 7x + y = 15 \\ 2x - y = 1 \end{cases}$.

15. Solve the system $\begin{cases} 2(x + y) = 10 \\ x - 2y = -1 \end{cases}$.

16. Solve the system $\begin{cases} 3x + y = 10 \\ x + y = 6 \end{cases}$.

17. Solve the system $\begin{cases} 4(x - y) = 8 \\ x + y = 10 \end{cases}$.

18. Solve the system $\begin{cases} x + 5y = 11 \\ 2x - y = 3 \end{cases}$.

19. Solve the system $\begin{cases} 6x + 2y = 20 \\ 3x + y = 10 \end{cases}$.

20. Solve the system $\begin{cases} 2x + 3y = 16 \\ 3x - 2y = 1 \end{cases}$.

Hard Questions

21. Solve the system $\begin{cases} 3x - 2y = 7 \\ 5x + 4y = 1 \end{cases}$.

22. Solve the system $\begin{cases} 2x + 5y = 17 \\ 4x - 3y = 5 \end{cases}$.

23. Solve the system $\begin{cases} x - 2y = -1 \\ 3x + 4y = 11 \end{cases}$.

24. Solve the system $\begin{cases} 7x + 2y = 0 \\ 3x - 5y = 4 \end{cases}$.

25. Solve the system $\begin{cases} 4x - y = 9 \\ 2x + 3y = -1 \end{cases}$.

26. The sum of two numbers is 12. Twice the first number is equal to three times the second number minus 6. Formulate the corresponding system of equations and solve for the numbers.

27. Solve the system $\begin{cases} \frac{1}{2}x + \frac{1}{3}y = 5 \\ \frac{1}{4}x - \frac{1}{6}y = 1 \end{cases}$.

28. Solve the system $\begin{cases} 3(x - y) = 12 \\ 2x + y = 9 \end{cases}$.

29. Solve the system $\begin{cases} \frac{2x}{3} + y = 8 \\ x - \frac{y}{2} = 3 \end{cases}$.

30. Solve the system $\begin{cases} x + 2y = 7 \\ 4x - 3y = 5 \end{cases}$.