In this worksheet you will challenge yourself by solving systems of three equations in three unknown variables using substitution and elimination methods. Work carefully through each problem and check your answers.

Easy Questions

1. Solve the system: $x + y + z = 6$, $x - y + z = 2$, $2x + y - z = 3$.
2. Solve the system: $2x - y + z = 1$, $x + y + 2z = 8$, $-x + 2y + z = 3$.
3. Solve the system: $x + y + z = 3$, $x = 2$, $y + z = 1$.
4. Solve the system: $x + 2y + 3z = 14$, $2x - y + z = 3$, $3x + y - z = 7$.
5. Solve the system: $3x + y + 2z = 10$, $x - y + z = 2$, $2x + y + z = 8$.

Intermediate Questions

6. Solve the system: $2x + y - z = 0$, $x + 3y + 2z = 5$, $3x + 2y + z = 4$.
7. Solve the system: $x + 2y + 3z = 9$, $2x + 3y + 4z = 13$, $3x + y + 2z = 7$.
8. Solve the system: $4x - y + 2z = 10$, $3x + 2y - z = 5$, $x + y + z = 4$.
9. Solve the system: $3x + 4y - z = 11$, $2x - y + 3z = 8$, $-x + 2y + z = 3$.
10. Solve the system: $5x - 2y + z = 7$, $x + y + 2z = 6$, $2x - 3y + 4z = 5$.
11. Solve the system: $x + 3y - 2z = 4$, $2x - y + z = 1$, $3x + y - z = 2$.
12. Solve the system: $2x + y + 3z = 14$, $3x - y + 2z = 10$, $x + 2y + z = 6$.
13. Solve the system: $4x + 2y - z = 5$, $3x - y + 2z = 4$, $2x + 3y + z = 7$.
14. Solve the system: $2x - y + z = 3$, $3x + y - 2z = 4$, $x + 2y + z = 8$.
15. Solve the system: $3x + 2y + z = 9$, $4x - y + 2z = 8$, $2x + 3y - z = 5$.
16. Solve the system: $2x + 4y + z = 12$, $x - y + 3z = 10$, $3x + y + 2z = 11$.
17. Solve the system: $5x + y - 2z = 6$, $2x - 3y + z = 4$, $x + 2y + 3z = 7$.
18. Solve the system: $3x - y + 4z = 10$, $x + 2y - z = 3$, $2x + y + z = 5$.
19. Solve the system: $4x + y + 2z = 11$, $x + 3y - z = 2$, $2x - y + 3z = 7$.
20. Solve the system: $2x + 3y + z = 9$, $x - 2y + 4z = 6$, $3x + y - z = 5$.

Hard Questions

21. Solve the system: $\frac{x}{2} + y + z = 7$, $2x - \frac{y}{3} + 2z = 5$, $3x + 4y - \frac{z}{2} = 8$.

22. Solve the system: $3x + 2y - 4z = 2$, $5x - 3y + z = 1$, $2x + y + 3z = 7$.

23. Solve the system: $-x + 2y - z = 0$, $3x - y + 4z = 10$, $2x + 3y - 2z = 3$.

24. Solve the system: $4x - 5y + 2z = 11$, $-3x + 2y - z = -5$, $7x + y + 3z = 20$.

25. Solve the system: $6x + 3y - 2z = 4$, $4x - y + z = 6$, $-2x + 5y + 3z = 1$.

26. Solve the system: $\frac{3}{2}x + 2y - z = \frac{7}{2}$, $x - y + 2z = \frac{9}{2}$, $2x + \frac{1}{2}y + 3z = \frac{15}{2}$.

27. Solve the system: $7x - 2y + 3z = 10$, $-3x + 4y - z = 5$, $2x + y + 4z = 8$.

28. Solve the system: $5x + 2y - z = 4$, $-x + 3y + 2z = 7$, $4x - y + 3z = 6$.

29. Solve the system: $3x + 4y + 2z = 11$, $2x - y - 3z = -4$, $5x + y - z = 9$.

30. Solve the system: $2x - 3y + z = 0$, $4x + y - 2z = 6$, $-x + 2y + 3z = 5$.