ILLAWARRA TUTORING

This worksheet challenges you to solve systems of three simultaneous equations with three unknown variables using substitution and elimination. Work through the following questions in order, starting with the easier problems and gradually progressing to more challenging ones.

Easy Questions

1. Solve the system $x + y + z = 6$; $x = 2$; $y = 3$. Find the value of z.

2. Solve the system $x + 2y + z = 10$; $x = 1$; $y = 4$. Determine z.

3. Solve the system $x + y + z = 12$; $y = z$; $x = 5$. Find the values of y and z.

4. Solve the system $x + y + z = 15$; $x - y = 3$; $z = 7$. Find the values of x and y.

5. Solve the system $2x + y + z = 11$; $x = 2$; $y = z$. Determine y and z.

Intermediate Questions

6. Solve the system $2x + y - z = 4$; $x - 3y + 2z = -2$; $3x + 2y + z = 7$ using substitution and elimination.

7. Solve the system $x + y + z = 6$; $2x - y + 3z = 14$; $-x + 4y + z = 2$.

8. Solve the system $3x + 2y - z = 5$; $2x - y + 2z = 3$; $x + y + 3z = 10$.

9. Solve the system $4x - y + 2z = 9$; $2x + 3y - z = 4$; $-x + 2y + 3z = 7$.

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

11. Solve the system $2x + y + z = 7$; $x - y + 2z = 4$; $3x + 2y - z = 5$.

12. Solve the system $x + 2y + 3z = 14$; $2x - y + z = 3$; $-x + 3y + 2z = 8$.

13. Solve the system $2x - 3y + z = -1$; $4x + y - 2z = 6$; $-x + 2y + 3z = 10$.

14. Solve the system $3x + y - 2z = 1$; $-x + 4y + z = 7$; $2x - y + 3z = 8$.

15. Solve the system $x + y - z = 2$; $2x + 3y + z = 12$; $-x + y + 2z = 3$.

16. Solve the system $2x + y + 3z = 11$; $x - 2y + z = 1$; $3x + 4y + 2z = 18$.

17. Solve the system $4x - y + 2z = 5$; $3x + 2y - z = 7$; $5x + y + 3z = 16$.

18. Solve the system $2x + 3y - z = 4$; $x + 4y + z = 12$; $3x - y + 2z = 7$.

19. Solve the system $x - y + z = 1$; $2x + y - 2z = -3$; $3x - 2y + 4z = 10$.

20. Solve the system $2x + y - 3z = -1$; $x + 2y + z = 7$; $3x - y + 2z = 8$.

Hard Questions

21. Solve the system $3x - 2y + z = 4$; $2x + y - 3z = -1$; $-x + 4y + 2z = 10$.

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

23. Solve the system $2x - 3y + 4z = 8$; $-x + 2y - z = -3$; $3x - y + 2z = 7$.

24. Solve the system $x + 4y - 2z = 6$; $3x - 2y + z = 4$; $2x + y + 3z = 11$.

25. Solve the system $4x + y - 3z = 5$; $-x + 2y + z = 2$; $3x - y + 2z = 7$.

26. Solve the system $2x + 3y - z = 4$; $3x - y + 2z = 7$; $x + 2y + 5z = 12$.

27. Solve the system $3x + y + z = 5$; $2x - 2y + 3z = 8$; $-x + 4y - z = -2$.

28. Solve the system $\frac{x}{2} + \frac{y}{3} + \frac{z}{4} = 3$; $x - y + z = 2$; $2x + 3y - z = 4$. (Hint: Multiply the first equation by 12 to eliminate fractions.)

29. Solve the system $2x + y - z = 0$; $-x + 3y + 2z = 5$; $4x - 2y + z = 6$.

30. Solve the system $3x - y + 2z = 4$; $x + 4y - z = 2$; $2x - 3y + 3z = 7$.