

8.3 Practice Set

1. What is a matrix and how can a matrix be used to solve a system of equations?
2. What are row operations and how are they related to the process of elimination?
3. When are matrices easier to use than other methods to solve a system?
4. What does it mean if you get a row of 0's while you are performing row operations?
5. What does it mean if you get all 0's in a row on the left side of an augmented matrix, but a non-zero number on the right side of the augmented matrix?

Solve each of the following systems of equations using matrices. If the system is dependent or inconsistent, state this.

6.
$$\begin{cases} x + 4y = 8 \\ x - y = 0 \end{cases}$$

7.
$$\begin{cases} -3x + 7y = 10 \\ 2x + y = -1 \end{cases}$$

8.
$$\begin{cases} 9x - 6y = -12 \\ 3x - y = 1 \end{cases}$$

9.
$$\begin{cases} 5x - y - 15z = -2 \\ 4x + y - 2z = 12 \\ -5y + 6z = -4 \end{cases}$$

$$10. \quad \begin{cases} 4x - 3y + z = 24 \\ 2x + y = 7 \\ x - 2z = -6 \end{cases}$$

$$11. \quad \begin{cases} x + y - z = 3 \\ -x - y + z = -3 \\ -2x + 2y + 2z = -6 \end{cases}$$

$$12. \quad \begin{cases} 6x + 10y - 2z = 6 \\ x - y + z = 15 \\ -3x + 7y - 4z = -24 \end{cases}$$

$$13. \quad \begin{cases} 2x + 3y - z = -1 \\ 3x - 4y + 7z = 18 \\ -4x - 6y - 2z = 4 \end{cases}$$

$$14. \quad \begin{cases} 5x - 2y + 4z = 1 \\ 20x + 8y - 16z = 4 \\ 15x - 2y + 8z = 4 \end{cases}$$

$$15. \quad \begin{cases} 2x + 5z = 15 \\ -5x - 4y = -25 \\ x - y - 15z = -10 \end{cases}$$

Distributed Practice Problems

Perform the indicated operations and/or simplify each of the following expressions completely.

$$16. \quad (-7x^3 + 4x^2 + 9x - 1) - (-3x^3 + 9x^2 - 7x + 5)$$

$$17. \quad (4x + 3)(4x - 3)(5x + y)$$

$$18. \quad (5x^{-3}y^2)^{-3}(4x^{-5}y^3)^2$$

$$19. \quad (5x^4 - 7x^3 + 2x - 1) \div (x + 3)$$

$$20. \quad \frac{x^{-1}+y^{-1}}{x^{-3}+y^{-3}}$$

$$21. \quad (\sqrt{x-4}+3)^2$$

$$22. \quad \sqrt[5]{-64x^{18}y^6}$$

$$23. \quad \log_2(x+3) + \frac{1}{2}\log_2 x - 2\log_2(x-1)$$

$$24. \quad \sqrt[4]{\frac{16}{9x^3}}$$

$$25. \quad x(x-1)(3x+5) - (x+1)(x-2)$$