Chapter 3

3.1 **Graph the linear system and estimate the solution. Then check the solution algebraically.**

1. $y = 2x - 1$
$y = x - 4$

2. $y = -x + 3$
$y = -4x$

3. $x + 2y = 6$
$-5x + 6y = -2$

4. $-2x + 7y = -7$
$4x - 14y = 14$

3.2 **Solve the system using any algebraic method.**

5. $-5x - y = -3$
$x - 4y = 9$

6. $4x - 2y = -6$
$-3x + y = -3$

7. $4x + 3y = -5$
$12x + 4y = 10$

8. $3x + 2y = 4$
$-7x - 5y = -7$

3.3 **Graph the system of inequalities.**

9. $x > 4$
$y \geq -1$

10. $x + y < -2$
$x - 3y > 6$

11. $x \leq 5$
$y > 3$
$y > x$

12. $x > -3$
$x \leq 2$
$2x + 3y < 10$
$y > -4x$

3.4 **Solve the system using any algebraic method.**

13. $3x + y - z = -6$
$-x + 2y + 3z = -1$
$5x - 2y + 6z = 54$

14. $x + y - z = 7$
$2x - 3y + z = 2$
$4x + 2y - 2z = 20$

15. $-x + y - 2z = 1.5$
$4x - y + 5z = -6$
$2x + y - 2z = 6$

16. $-6x + y + 9z = 4$
$2x - 3y - z = -6$
$8x + 5y - 4z = 10$

3.5 **Perform the indicated operation.**

17. $\begin{bmatrix} -6 & 7 \\ 0 & 3 \end{bmatrix} + \begin{bmatrix} -6 & 2 \\ -8 & 1 \end{bmatrix}$

18. $-\dfrac{2}{3}\begin{bmatrix} -9 & 3 \\ 4 & -1 \end{bmatrix}$

19. $\begin{bmatrix} 10 & 17 & -9 \\ -6 & 4 & 11 \end{bmatrix} - \begin{bmatrix} -6 & 8 & -2 \\ -4 & -9 & 4 \end{bmatrix}$

3.6 **Find the product. If the product is not defined, state the reason.**

20. $\begin{bmatrix} 4 & 1 \\ -3 & 0 \end{bmatrix}\begin{bmatrix} -7 & 5 \\ 7 & -3 \end{bmatrix}$

21. $\begin{bmatrix} -16 \\ 2 \end{bmatrix}\begin{bmatrix} 4 \\ 15 \end{bmatrix}$

22. $\begin{bmatrix} 5 & -1 & 0 \\ 4 & -2 & 9 \end{bmatrix}\begin{bmatrix} 12 \\ -7 \\ 3 \end{bmatrix}$

3.7 **Evaluate the determinant of the matrix.**

23. $\begin{bmatrix} 5 & 8 \\ -2 & 10 \end{bmatrix}$

24. $\begin{bmatrix} 13 & 7 \\ -11 & -4 \end{bmatrix}$

25. $\begin{bmatrix} 1 & -3 & -2 \\ 7 & 4 & 0 \\ -7 & 2 & 3 \end{bmatrix}$

26. $\begin{bmatrix} 6 & 0 & 5 \\ -4 & 2 & 1 \\ 1 & 0 & 0.5 \end{bmatrix}$

3.7 **Use Cramer's rule to solve the linear system.**

27. $2x + y = -8$
$-5x - 2y = 13$

28. $8x + 3y = 1$
$7x + 3y = -1$

29. $2x - 2y - 3z = 9$
$3x + z = 10$
$x + y = 0$

30. $2x + y + 3z = 4$
$-8x + 4y + z = -7$
$x + 2y + 3z = -1$

3.8 **Find the inverse of the matrix.**

31. $\begin{bmatrix} 3 & 7 \\ 3 & 8 \end{bmatrix}$

32. $\begin{bmatrix} 1 & 4 \\ 0 & 5 \end{bmatrix}$

33. $\begin{bmatrix} -2 & -5 \\ 3 & 8 \end{bmatrix}$

34. $\begin{bmatrix} 9 & 2 \\ 18 & 5 \end{bmatrix}$

3.8 **Use an inverse matrix to solve the linear system.**

35. $x + 3y = -4$
$-2x + y = -34$

36. $2x + 3y = 6$
$-x - 6y = -9$

37. $3x - 8y = 0$
$2x + y = -19$

38. $x + y = 7$
$-5x + 3y = -3$