CHAPTER TEST

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

1. $4x + y = 5$
$3x - y = 2$

2. $x + 2y = -6$
$-6x - 2y = -14$

3. $2x - 3y = 15$
$x - \frac{3}{2}y = -3$

4. $3x - y = 12$
$-x + 8y = -4$

Graph the system of linear inequalities.

5. $2x + y < 6$
$y > -2$

6. $x - 3y \geq 9$
$\frac{1}{3}x - y \leq 3$

7. $x - 2y \leq -14$
$y \geq |x|$

8. $-3x + 4y > -12$
$y < -2|x| + 5$

Solve the system using any algebraic method.

9. $3x + y = -9$
$x - 2y = -10$

10. $2x + 3y = -2$
$4x + 7y = -6$

11. $x + 4y = -26$
$-5x - 2y = -14$

12. $x - y + z = -3$
$2x - y + 5z = 4$
$4x + 2y - z = 2$

13. $x + y + z = 3$
$-x + 3y + 2z = -8$
$5y + z = 2$

14. $2x - 5y - z = 17$
$x + y + 3z = 19$
$-4x + 6y + z = -20$

Use the given matrices to evaluate the expression, if possible. If not possible, state the reason.

$$A = \begin{bmatrix} 1 & -2 \\ 4 & -3 \end{bmatrix}, B = \begin{bmatrix} 3 & 5 \\ -1 & 0 \end{bmatrix}, C = \begin{bmatrix} -6 & 8 \\ 10 & 15 \end{bmatrix}, D = \begin{bmatrix} -1 & 3 & -2 \\ 2 & 0 & -1 \end{bmatrix}, E = \begin{bmatrix} 4 & -1 & 3 \\ 6 & -2 & 1 \end{bmatrix}$$

15. $2A + B$

16. $C - 3B$

17. $A - 2D$

18. $4D + E$

19. AC

20. DE

21. $(A + B)D$

22. $A(C - B)$

Evaluate the determinant of the matrix.

23. $\begin{bmatrix} 3 & -2 \\ 4 & 1 \end{bmatrix}$

24. $\begin{bmatrix} -4 & 5 \\ 2 & -1 \end{bmatrix}$

25. $\begin{bmatrix} -1 & 3 & 1 \\ 0 & 2 & -3 \\ 5 & 1 & -2 \end{bmatrix}$

26. $\begin{bmatrix} 2 & 0 & -1 \\ 5 & -3 & 2 \\ 1 & 4 & 6 \end{bmatrix}$

Use an inverse matrix to solve the linear system.

27. $3x + 4y = 6$
$4x + 5y = 7$

28. $2x - 7y = -36$
$x - 3y = -16$

29. $5x + 3y = -5$
$-9x - 6y = 12$

30. $3x + 2y = 15$
$-x + 4y = -33$

31. **FINANCE** A total of $15,000 is invested in two corporate bonds that pay 5% and 7% simple annual interest. The investor wants to earn $880 in interest per year from the bonds. How much should be invested in each bond?

32. **TICKET SALES** For the opening day of a carnival, 800 admission tickets were sold. The receipts totaled $3775. Tickets for children cost $3 each, tickets for adults cost $8 each, and tickets for senior citizens cost $5 each. There were twice as many children's tickets sold as adult tickets. How many of each type of ticket were sold?

33. **BOATING** On a certain river, a motorboat can travel 34 miles per hour with the current and 28 miles per hour against the current. Find the speed of the motorboat in still water and the speed of the current.