

Solve each equation.

1. $\begin{bmatrix} 3x + 1 \\ 2y \end{bmatrix} = \begin{bmatrix} 10 \\ 4 + y \end{bmatrix}$

2. $\begin{bmatrix} 2x & y + 1 \\ 13 & -2 \end{bmatrix} = \begin{bmatrix} -16 & -7 \\ 13 & z - 8 \end{bmatrix}$

Perform the indicated operations. If the matrix does not exist, write *impossible*.

3. $\begin{bmatrix} 2 & -4 & 1 \\ 3 & 8 & -2 \end{bmatrix} - 2 \begin{bmatrix} 1 & 2 & -4 \\ -2 & 3 & 7 \end{bmatrix}$

4. $\begin{bmatrix} 1 & 2 \\ -4 & 3 \\ 5 & 2 \end{bmatrix} \cdot \begin{bmatrix} 5 \\ 4 \end{bmatrix}$

5. $\begin{bmatrix} 1 & 6 & 7 \\ 1 & -3 & -4 \end{bmatrix} \cdot \begin{bmatrix} -4 & 3 \\ -1 & -2 \\ 2 & 5 \end{bmatrix}$

Find the value of each determinant.

6. $\begin{vmatrix} -1 & 4 \\ -6 & 3 \end{vmatrix}$

7. $\begin{vmatrix} -2 & 0 & 5 \\ -3 & 4 & 0 \\ 1 & 3 & -1 \end{vmatrix}$

Find the inverse of each matrix, if it exists.

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

9. $\begin{bmatrix} -6 & -3 \\ 8 & 4 \end{bmatrix}$

Solve each matrix equation or system of equations by using inverse matrices.

10. $\begin{bmatrix} 5 & 7 \\ -9 & 3 \end{bmatrix} \cdot \begin{bmatrix} m \\ n \end{bmatrix} = \begin{bmatrix} 41 \\ -105 \end{bmatrix}$

11. $\begin{bmatrix} -2 & 3 \\ 11 & -7 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 7 \\ -10 \end{bmatrix}$

12. $5a + 2b = -49$

$2a + 9b = 5$

13. $4c + 9d = 6$

$13c - 11d = -61$

14. **ACCOUNTING** A small business' bank account is charged a service fee for each electronic credit and electronic debit transaction. Their transactions and charges for two recent months are listed in the table.

Month	Electronic Credits	Electronic Debits	Cost
January	28	18	\$7.22
February	25	31	\$7.79

Use a system of equations to find the fee for each electronic credit and electronic debit transaction.

For Exercises 15–17, use $\triangle ABC$ whose vertices have coordinates $A(6, 3)$, $B(1, 5)$, and $C(-1, 4)$.

15. Use a determinant to find the area of $\triangle ABC$.
16. Translate $\triangle ABC$ so that the coordinates of B' are $(3, 1)$. What are the coordinates of A' and C' ?
17. Find the coordinates of the vertices of a triangle that is a dilation of $\triangle ABC$ with a perimeter five times that of $\triangle ABC$.

18. **MULTIPLE CHOICE** Lupe is preparing boxes of assorted chocolates. Chocolate-covered peanuts cost \$7 per pound. Chocolate-covered caramels cost \$6.50 per pound. The boxes of assorted candies contain five more pounds of peanut candies than caramel candies. If the total amount sold was \$575, how many pounds of each candy were needed to make the boxes?

A 40 lb peanut, 45 lb caramel

B 40 lb caramel, 45 lb peanut

C 40 lb peanut, 35 lb caramel

D 40 lb caramel, 35 lb peanut