2-5

Practice

Determinants and Multiplicative Inverses of Matrices

Find the value of each determinant.

1. $\begin{vmatrix} -2 & 3 \\ 8 & -12 \end{vmatrix}$

2. $\begin{vmatrix} 3 & -5 \\ 7 & 9 \end{vmatrix}$

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

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

Find the inverse of each matrix, if it exists.

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

6. $\begin{vmatrix} 5 & 2 \\ 10 & 4 \end{vmatrix}$

Solve each system by using matrix equations.

7. $2x - 3y = 17$
$3x + y = 9$

8. $4x - 3y = -16$
$2x + 5y = 18$

Solve each matrix equation.

9. $\begin{bmatrix} 2 & -1 & 3 \\ 1 & 2 & 1 \\ -1 & -3 & -2 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} -8 \\ 3 \\ -7 \end{bmatrix}$, if the inverse is $-\frac{1}{6}\begin{bmatrix} -1 & -11 & -7 \\ 1 & -1 & 1 \\ -1 & 7 & 5 \end{bmatrix}$

10. $\begin{bmatrix} 5 & -2 & 4 \\ 3 & -4 & 2 \\ 1 & -3 & 1 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} -2 \\ 0 \\ 1 \end{bmatrix}$, if the inverse is $-\frac{1}{8}\begin{bmatrix} 2 & -10 & 12 \\ -1 & 1 & 2 \\ -5 & 13 & -14 \end{bmatrix}$

11. ***Landscaping*** Two dump truck have capacities of 10 tons and 12 tons. They make a total of 20 round trips to haul 226 tons of topsoil for a landscaping project. How many round trips does each truck make?