

LESSON
4-4

Practice A

Determinants and Cramer's Rule

Find the determinant of each matrix.

The first one has been started for you.

1. $\begin{bmatrix} 6 & -2 \\ 1 & 10 \end{bmatrix}$

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

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

= 6(____) - (**1**)(____)

Use Cramer's rule to solve each system of equations.

4. $\begin{cases} x - 2y = -9 \\ 3x + y = 1 \end{cases}$

$$\begin{bmatrix} 1 & - \\ _ & 1 \end{bmatrix}$$

a. Write the coefficient matrix.

b. Find D, the determinant of the coefficient matrix.

$1 \cdot 1 - _ \cdot _ = _$

c. Use Cramer's rule to write the solutions for x and y.

$$x = \frac{\begin{vmatrix} c_1 & b_1 \\ c_2 & b_2 \end{vmatrix}}{D} = \frac{\begin{vmatrix} -9 & -2 \\ _ & _ \end{vmatrix}}{\underline{7}}$$

$$\frac{-7}{7} = -1$$

$$y = \frac{\begin{vmatrix} a_1 & c_1 \\ a_2 & c_2 \end{vmatrix}}{D} = \frac{\begin{vmatrix} _ & _ \\ _ & _ \end{vmatrix}}{\underline{\quad}}$$

$$\frac{28}{7} = 4$$

d. Evaluate the determinants in the numerators and solve for x and y.

5. $\begin{cases} 2x + 3y = 4 \\ x - 2y = 9 \end{cases}$

6. $\begin{cases} 3x + y = 5 \\ 2x - 3y = 18 \end{cases}$

LESSON
4-4 Practice A
Determinants and Cramer's Rule

Find the determinant of each matrix.
 The first one has been started for you.

1. $\begin{bmatrix} 6 & -2 \\ 1 & 10 \end{bmatrix}$ 2. $\begin{bmatrix} 3 & -1 \\ -7 & 2 \end{bmatrix}$ 3. $\begin{bmatrix} 2 & 9 \\ 1 & -3 \end{bmatrix}$

= 6(10) - (1)(-2)

60 - (-2) = 62 -1 -15

Use Cramer's rule to solve each system of equations.

4. $\begin{cases} x - 2y = -9 \\ 3x + y = 1 \end{cases}$ $\begin{bmatrix} 1 & -2 \\ 3 & 1 \end{bmatrix}$

a. Write the coefficient matrix. _____

b. Find D, the determinant of the coefficient matrix. $1 \cdot 1 - 3 \cdot -2 = 7$

c. Use Cramer's rule to write the solutions for x and y.

$x = \frac{\begin{vmatrix} c_1 & b_1 \\ c_2 & b_2 \end{vmatrix}}{D} = \frac{\begin{vmatrix} -9 & -2 \\ 1 & 1 \end{vmatrix}}{7}$ $y = \frac{\begin{vmatrix} a_1 & c_1 \\ a_2 & c_2 \end{vmatrix}}{D} = \frac{\begin{vmatrix} 1 & -9 \\ 3 & 1 \end{vmatrix}}{7}$

$\frac{-7}{7} = -1$ $\frac{28}{7} = 4$

d. Evaluate the determinants in the numerators and solve for x and y. $x = -1; y = 4$

5. $\begin{cases} 2x + 3y = 4 \\ x - 2y = 9 \end{cases}$ $x = 5; y = -2$

6. $\begin{cases} 3x + y = 5 \\ 2x - 3y = 18 \end{cases}$ $x = 3; y = -4$