

TEKS 2A.3.B



LESSON

4-4

Practice B

Determinants and Cramer's Rule

Find the determinant of each matrix.

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

2. $\begin{bmatrix} -6 & 3 \\ 9 & -5 \end{bmatrix}$

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

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

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

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

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

7. $\begin{cases} 2x + 3y = -1 \\ 3x + 2y = 16 \end{cases}$

8. $\begin{cases} 4x - 3y = 9 \\ 3x + 2y = 28 \end{cases}$

9. $\begin{cases} 8x - 3y = 20 \\ 3x - 2y = 11 \end{cases}$

10. $\begin{cases} 4y = -5x + 33 \\ 2y = 3x - 11 \end{cases}$

11. $\begin{cases} 27 + 4y = 3x \\ y = \frac{1}{3}x - 8 \end{cases}$

12. $\begin{cases} 7 - 5y + 4x = 0 \\ 16 - 2y - 5x = 0 \end{cases}$

Solve.

13. On Monday, Marla babysat for 4 hours, did yard work for 2 hours, and earned a total of \$41. On Friday, she babysat for 5 hours, did yard work for 3 hours, and earned a total of \$55.

a. Write a system of equations.

Let x = Marla's hourly rate for babysitting,
and y = her hourly rate for yard work.

b. Write the coefficient matrix. Evaluate its determinant.

c. Use Cramer's rule to find x and y .

d. What is Marla's hourly rate for each activity?



Practice B

Determinants and Cramer's Rule

Find the determinant of each matrix.

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

-16

2. $\begin{bmatrix} -6 & 3 \\ 9 & -5 \end{bmatrix}$

3

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

10

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

-36

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

-30

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

-31

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

7. $\begin{cases} 2x + 3y = -1 \\ 3x + 2y = 16 \end{cases}$

(10, -7)

8. $\begin{cases} 4x - 3y = 9 \\ 3x + 2y = 28 \end{cases}$

(6, 5)

9. $\begin{cases} 8x - 3y = 20 \\ 3x - 2y = 11 \end{cases}$

(1, -4)

10. $\begin{cases} 4y = -5x + 33 \\ 2y = 3x - 11 \end{cases}$

(5, 2)

11. $\begin{cases} 27 + 4y = 3x \\ y = \frac{1}{3}x - 8 \end{cases}$

(-3, -9)

12. $\begin{cases} 7 - 5y + 4x = 0 \\ 16 - 2y - 5x = 0 \end{cases}$

(2, 3)

Solve.

13. On Monday, Marla babysat for 4 hours, did yard work for 2 hours, and earned a total of \$41. On Friday, she babysat for 5 hours, did yard work for 3 hours, and earned a total of \$55.

a. Write a system of equations.

Let x = Marla's hourly rate for babysitting,
and y = her hourly rate for yard work.

$$\begin{cases} 4x + 2y = 41 \\ 5x + 3y = 55 \end{cases}$$

b. Write the coefficient matrix. Evaluate its determinant.

$$\begin{bmatrix} 4 & 2 \\ 5 & 3 \end{bmatrix}; \det = \begin{vmatrix} 4 & 2 \\ 5 & 3 \end{vmatrix} = 2$$

c. Use Cramer's rule to find x and y .

$$x = 6.5; y = 7.5$$

d. What is Marla's hourly rate for each activity?

Babysitting: \$6.50, yard work: \$7.50