Unit 4 Matrices Name _____
Homework

Use Cramer's rule to solve the linear system.

1. $9x + 2y = 7$
   $4x - 3y = 42$

2. $-x - 12y = 44$
   $12x - 15y = -51$

3. $4x - 5y = 13$
   $2x - 7y = 24$

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

Find the inverse of the matrix if it exists.

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

6. $\begin{bmatrix} 11 & -3 \\ -9 & 3 \end{bmatrix}$

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

8. $\begin{bmatrix} 8 & 6 \\ 3 & 2 \end{bmatrix}$

Tell whether the matrices are inverses of each other. Hint: product should be = I if they are

9. $\begin{bmatrix} 10 & -3 \\ 3 & -1 \end{bmatrix}$ *and* $\begin{bmatrix} 1 & 3 \\ 3 & -10 \end{bmatrix}$

10. $\begin{bmatrix} 11 & 2 & -8 \\ 4 & 1 & -3 \\ -8 & -1 & 6 \end{bmatrix}$ *and* $\begin{bmatrix} 3 & -4 & 2 \\ 0 & 2 & 1 \\ 4 & -5 & 3 \end{bmatrix}$

Solve the matrix equation for the variable matrix:

11. $\begin{bmatrix} -5 & -13 \\ 0 & 5 \end{bmatrix} X = \begin{bmatrix} 3 & 1 \\ -4 & 0 \end{bmatrix}$

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

13. $\begin{bmatrix} 3 & 7 \\ 1 & 4 \end{bmatrix} X + \begin{bmatrix} 8 & 5 \\ 1 & 15 \end{bmatrix} = \begin{bmatrix} 7 & -3 \\ -2 & -9 \end{bmatrix}$

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

Write the linear system as a matrix equation and then use an inverse matrix to SOLVE.

15. $3x + y = 8$
    $5x + 2y = 11$

16. $2x + 7y = -53$
    $x + 3y = -22$

17. $5x - 7y = 54$
    $x = -3y - 22$

18. $x + 2y = -9$
    $-2x - 3y = 14$

19. $9x - 5y = 43$
    $2y = 2x - 22$

20. $x - y - 3z = 9$
    $5x + 2y + z = -30$
    $-3x - y = 4$

$A^{-1} = \begin{bmatrix} 1 & 3 & 5 \\ -3 & -9 & -16 \\ 1 & 4 & 7 \end{bmatrix}$

Solve the matrix equation.

1. $\begin{bmatrix} -5 & -3 \\ 4 & 1 \end{bmatrix} X = \begin{bmatrix} -12 & -5 & 18 \\ 4 & -3 & -13 \end{bmatrix}$

2. $\begin{bmatrix} -7 & -9 \\ 4 & 5 \end{bmatrix} X + \begin{bmatrix} 3 & 4 \\ 4 & -3 \end{bmatrix} = \begin{bmatrix} 1 & 9 \\ 6 & -6 \end{bmatrix}$

Write the system as a matrix equation and then use the inverse to SOLVE.

3. -5x – 7y = -9
   2x + 3y = 3

4. 2y – z = -2
   5x + 2y + 3z = 4
   7x + 3y + 4z = -5

$A^{-1} = \begin{bmatrix} -1 & -11 & 8 \\ 1 & 7 & -5 \\ 1 & 14 & -10 \end{bmatrix}$