Precalculus   Review   Chapter 9   page 1 _____
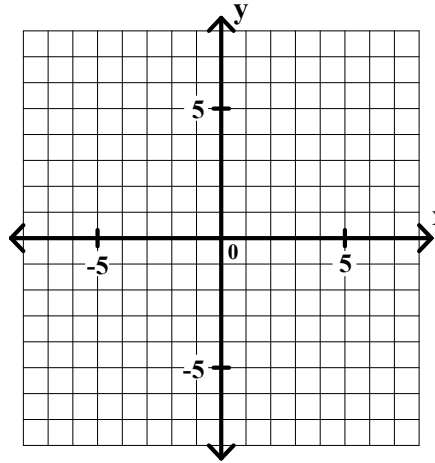
1. Use the graphing method to solve the system below. Show your work.

$x - 2y = 10$
$3x + 2y = 6$

2. Solve the following system of equations using the substitution method. Show your work neatly organized.

$2x - 3y = 12$
$y = 2x - 5$

3. Solve the following system of equations using the multiplication-addition method Show your work neatly organized.

$3x - 4y = 1$
$2x - 5y = 2$

Use Gauss-Jordan elimination to solve each of the following systems of equations. Show your work neatly organized.

3. $3x + 4y - 2z = 3$
        $2x + 3y + z = 8$
        $4x - 2y + 3z = -14$

5. $2a - b - c + 2d = -2$
        $a + 2b + c + d = 1$
        $3a + 5b + c + 2d = 0$
        $-2a + b + 2c - d = 3$

Use Cramer's rule to solve each of the following systems of equations. Show your work neatly organized.

6. $3x + 2y = 7$
         $5x - 3y = -2$

7. $x + 3z = -3$
         $3x - y = 2$
         $x + y + z = 8$

Given matrices A, B, C, and D below, perform the indicated operations.

$$A = \begin{bmatrix} -4 & 5 \\ 3 & 2 \end{bmatrix} \quad B = \begin{bmatrix} -2 & 1 \\ -3 & -4 \end{bmatrix} \quad C = \begin{bmatrix} 5 & 0 & -4 \\ 3 & -3 & 2 \end{bmatrix} \quad D = \begin{bmatrix} -1 & -3 \\ 5 & 3 \\ 1 & 6 \end{bmatrix}$$

8. $2A + 3B =$ 9. $A - 2B =$

10. $5A =$ 11. $-2D =$

12. $AB =$ 13. $BA =$

14. $CD =$ 15. $DC =$

Given matrix A, find A^{-1}. Show your work neatly organized.

16. $A = \begin{bmatrix} 2 & 0 \\ 1 & 3 \end{bmatrix}$

17. $A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & 2 & -1 \\ -3 & -5 & 1 \end{bmatrix}$

Evaluate each of the following determinants. Show your work neatly organized.

18.
$$\begin{vmatrix} 4 & 0 \\ 3 & 5 \end{vmatrix} = \underline{\hspace{2cm}}$$

19.
$$\begin{vmatrix} -2 & 3 & 1 \\ 2 & 0 & -1 \\ -1 & 4 & 3 \end{vmatrix} = \underline{\hspace{2cm}}$$

20.
$$\begin{vmatrix} 1 & 2 & -2 & 3 \\ -3 & 3 & 1 & -1 \\ 3 & -2 & -3 & 0 \\ 1 & 2 & 3 & 1 \end{vmatrix} = \underline{\hspace{2cm}}$$

Use a determinant to find the area of the triangle with the given vertices. Show your work neatly organized.

21.   (3, -2) (0, 1) (5, 9)   **22.   (-1, -8) (-4, 6) (5, 0)**

23. For this problem, you have to decode a message. You are given matrix A that was used to encode the matrix. You are also given matrix C, which represents the encoded message. Show your work neatly organized.

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & 2 & 4 \\ -1 & -1 & 2 \end{bmatrix} \qquad C = \begin{bmatrix} 48 & 73 & 5 \\ 81 & 95 & 20 \\ 18 & 8 & 10 \end{bmatrix}$$

Hint: Let matrix M represent the message matrix. I found matrix C by multiplying A times M. In other words, C = (A)(M). You, therefore, will find M by determining the inverse of A and multiplying it by C. In other words, M = (A^{-1})(C)