Precalculus Unit 11 – 11.3 – 11.4 Homework Worksheet
Inverse Matrices, Determinants, and Applications of Determinants

1. Find the inverse matrix for $A = \begin{bmatrix} 5 & 1 \\ -2 & -2 \end{bmatrix}$.

2. Find the inverse matrix for $A = \begin{bmatrix} 1 & 2 & -1 \\ 3 & 7 & -10 \\ -5 & -7 & -15 \end{bmatrix}$ using your calculator.

3. Write a matrix equation for the system $\begin{matrix} x + y + z = 0 \\ 3x + 5y + 4z = 5. \\ 3x + 6y + 5z = 2 \end{matrix}$ and use an inverse matrix to solve it.

4. Evaluate the following 2 x 2 determinants.

   a. $\begin{bmatrix} 3 & -3 \\ 4 & -8 \end{bmatrix}$

   b. $\begin{bmatrix} 4 & -3 \\ 0 & 0 \end{bmatrix}$

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

5. Evaluate the following 3 x 3 determinants. Show work.

   a. $\begin{bmatrix} -3 & 2 & 1 \\ 4 & 5 & 6 \\ 2 & -3 & 1 \end{bmatrix}$

   b. $\begin{bmatrix} -2 & 9 & 4 \\ 7 & -6 & 0 \\ 6 & 7 & -6 \end{bmatrix}$

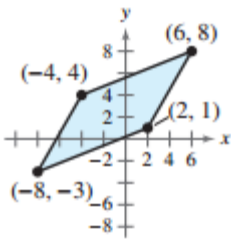6. Evaluate the following determinant using your calculator.

   $\begin{bmatrix} 2 & 6 & 6 & 2 \\ 2 & 7 & 3 & 6 \\ 1 & 5 & 0 & 1 \\ 3 & 7 & 0 & 7 \end{bmatrix}$

7. Evaluate the following determinant:

$$\begin{vmatrix} -6 & 7 & 2 & 0 & 5 \\ 0 & -1 & 3 & 4 & -3 \\ 0 & 0 & -7 & 0 & 4 \\ 0 & 0 & 0 & -2 & 1 \\ 0 & 0 & 0 & 0 & -2 \end{vmatrix}$$

8. Find the area of the triangle with vertices at $(-3,5), (2,6), and\ (3,-5)$.

9. Find the area of the figure given in the diagram below:

10. Solve the following system using Cramer's Rule.

$$4x - 3y = -10$$
$$6x + 9y = 12$$

11. Solve the following system using Cramer's Rule.

$$4x - y + z = -5$$
$$2x + 2y + 3z = 10$$
$$5x - 2y + 6z = 1$$

12. Solve the following system using Cramer's Rule.

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