ALGEBRA II REVIEW PROBLEMS
(Chapter 4)

1. Do/answer the following:

$A = \begin{bmatrix} 8 & 1 \\ -2 & 5 \end{bmatrix}$ $B = \begin{bmatrix} 6 & -8 \\ -3 & 4 \end{bmatrix}$ $C = \begin{bmatrix} 9 & 4 \\ 5 & 1 \\ 2 & 0 \end{bmatrix}$ $D = \begin{bmatrix} -3 & 1 & 0 \\ -2 & -1 & 5 \end{bmatrix}$ $E = \begin{bmatrix} 4 & 6 & -1 \\ 2 & 3 & 2 \\ 1 & -1 & 1 \end{bmatrix}$

a. State the dimensions of D

b. In C, c_{21} = ?

c. $A - B$

d. ½ B

e. BA

f. CD

g. Evaluate the determinant of B

h. A^{-1}

i. Evaluate the determinant of E

2. Solve the following:

a. $\begin{bmatrix} 25 & -60 \\ 42 & 91 \end{bmatrix} + X = \begin{bmatrix} -37 & 61 \\ 85 & 37 \end{bmatrix}$

b. $\begin{bmatrix} 2 & 1 \\ -1 & 7 \end{bmatrix} X = \begin{bmatrix} 8 & 1 \\ -12 & 41 \end{bmatrix}$

c. $\begin{bmatrix} 1 & -2 \\ 1 & 3 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 7 \\ 12 \end{bmatrix}$

3. Solve each system by the method indicated:

a. Use a matrix equation:

$2x + 5y = 10$
$x + y = 2$

b. Use Cramer's Rule:

$x - 4y = 16$
$x + 2y = 4$

c. Use augmented matrices:

$3x - 4y = 13$
$2x + y = 5$

ANSWERS

1. **a.** 2 X 3 **b.** 5 **c.** $\begin{bmatrix} 2 & 9 \\ 1 & 1 \end{bmatrix}$

d. $\begin{bmatrix} 3 & -4 \\ -1.5 & 2 \end{bmatrix}$ **e.** $\begin{bmatrix} 64 & -34 \\ -32 & 17 \end{bmatrix}$ **f.** $\begin{bmatrix} -35 & 5 & 20 \\ -17 & 4 & 5 \\ -6 & 2 & 0 \end{bmatrix}$

g. 0 **h.** $\begin{bmatrix} \frac{5}{42} & \frac{-1}{42} \\ \frac{1}{21} & \frac{4}{21} \end{bmatrix}$ **i.** 25

2. **a.** $X = \begin{bmatrix} -62 & 121 \\ 43 & -54 \end{bmatrix}$ **b.** $X = \begin{bmatrix} \frac{68}{15} & \frac{-34}{15} \\ \frac{-16}{15} & \frac{83}{15} \end{bmatrix}$ **c.** $\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 9 \\ 1 \end{bmatrix} = (9, 1)$

3. **a.** $\begin{bmatrix} 2 & 5 \\ 1 & 1 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 10 \\ 2 \end{bmatrix}$ ---> (0, 2)

b. $x = \frac{Dx}{D} = \frac{48}{6} = 8$ $y = \frac{Dy}{D} = \frac{-12}{6} = -2$ } (8, -2)

c. $\left[\begin{array}{cc|c} 3 & -4 & 13 \\ 2 & 1 & 5 \end{array}\right]$ ---> $\left[\begin{array}{cc|c} 1 & 0 & 3 \\ 0 & 1 & -1 \end{array}\right]$ ---> (3, -1)