Precalculus Unit 11: 11.1 Homework Worksheet
Matrices

1. Solve the following system by using a matrix and row operations.

$$x + 2y - z = 9$$
$$2x - y + 3z = -2$$
$$3x - 3y - 4z = 1$$

2. Solve the following system by using a matrix and row operations.

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

3. For each of the row reduced matrices below, write the solution.

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

4. Solve the following two systems using technology. Write your initial augmented matrix, the reduced row echelon form matrix, and the solution.

    a. $x - y + 2z + w = 4$
               $y + z - 3 = 0$
               $z = w + 2$

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

5. A dietitian at Cook County Hospital wants a patient to have a meal that has 65 grams of protein, 95 grams of carbohydrates, and 905 milligrams of calcium. The hospital food service tells the dietitian that the dinner for today is chicken a la king, baked potatoes, and 2% milk. Each serving of chicken a la king has 30 grams of protein, 35 grams of carbohydrates, and 200 milligrams of calcium. Each serving of baked potatoes contains 4 grams of protein, 33 grams of carbohydrates, and 10 milligrams of calcium. Each glass of 2% milk contains 9 grams of protein, 13 grams of carbohydrates, and 300 milligrams of calcium. How many servings of each food should the dietitian provide for the patient?