Sheet #451

Name: Block:

Matrix equations and systems of equations.

Part A: Graphing/matrix calculator allowed.

1. Solve. Check your answers.

$$\begin{cases} -x + 2y - 3z = -6 \\ 2x - y - z = -3 \\ x + 3y - 5z = -9 \end{cases}$$

(a) Write as an augmented matrix.

(b) Solve using the reduced row echelon form (rref).

2. You can purchase peanuts for \$2.50 per pound, almonds for \$6.00 per pound, and cashews for \$8.00 per pound. You want to make a 1,000-pound mixture that costs \$5.00 per pound.

(a) You want 3 times as many peanuts as cashews. How many pounds of each type of nut should be used?

Write the equations.

Give answers using both words and numbers, with numbers rounded to the nearest tenth of a pound.

Part B: No graphing calculator. Regular calculator OK.

3. Consider the matrix

$$A=\begin{bmatrix} 1 & -1 \\ -2 & 6 \end{bmatrix}$$

(a) Write the determinant. Find it.

(b) Showing the math, find the inverse.

(c) Use the inverse of the matrix A to solve for the matrix X.

$$\begin{bmatrix} 1 & -1 \\ -2 & 6 \end{bmatrix} X=\begin{bmatrix} -2 & 3 \\ 1 & 2 \end{bmatrix}$$

Write the equation for finding X.

Find X.

(d) Solve using the inverse matrix method.

$$\begin{cases} x - y = 5 \\ -2x + 6y = -24 \end{cases}$$

Rewrite the system of equations as a matrix equation.

Write the matrix equation for finding x and y.

Find x and y.