Precalculus Worksheet: Solving Systems of Equations Using Matrices

Find the matrix inverse, if it exists. Write all entries in fraction form.

1.  \_\_\_\_\_\_\_\_\_\_\_\_\_ 2.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 3.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 4.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Use a matrix inverse to solve the following matrix equations.

1. $\left[\begin{matrix}1&1&2\\3&1&0\\-2&0&3\end{matrix}\right]X=\left[\begin{matrix}19&28&10\\27&30&8\\-4&4&4\end{matrix}\right]$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Rewrite** the system as a matrix equation, then use an inverse to solve.

1.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Write a system of equations to model the following word problems, then solve using an inverse matrix. Show your matrix representation in the space provided.

1. Ty bought four candy bars and three packs of gum for a total of $5.73. Zack bought one candy bar and one pack of gum for $1.68. What is the price of each item?
2. The Laredo Sports Shop sold 10 balls, 3 bats, and 2 bases on Monday for $99. On Tuesday, it sold 4 balls, 8 bats and 2 bases for $78. On Wednesday, 2 balls, 3 bats and one base were sold for $33.60. Find the price of each item.
3. The “Perpetually 21” store is having a winter clearance sale. Margot bought 4 sweaters, a pair of gloves and a scarf for $34.95. Judith bought 3 sweaters, 2 pairs of gloves and 5 scarves for $46.95. Amy bought a sweater and 3 scarves for $18.99. Find the cost of each item.
4. A beach resort has two vacations specials. One includes a 2 night stay and 3 meals for $320. The other deal includes a 5 night stay and 8 meals for $807. Find the cost per night and the cost per meal.
5. Melinda needed to mail a package. She used $.02 stamps and $.10 stamps to mail the package. If she used 15 stamps worth $.78, how many of each type of stamp did she use?