Name: _____ Class: _____ Date: _____ ID: A

Practice Quiz #2: Solving Complex Systems of Equations and Inequalities and Linear Programining

Problem

1. **For each of the following systems of three equations, please solve the system of equations, state your solution as a three dimensional coordinate point, and determine the classification (Consistent or Inconsistent) of the system of equations.(SHOW ALL OF YOUR WORK.)**

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

      $-3x+y+5z=-5$

      $-4x+2y+z=13$

2. **For each of the following application word problems, please create three equations from the given information and then solve the system of three equations. (SHOW ALL OF YOUR WORK.)**

   2. Five hundred tickets were sold for a certain music concert. The tickets for adults sold for $7.50, the tickets for children sold for $4.00, and tickets for senior citizens sold for $3.50. The revenue for the Monday performance was $3,025. Twice as many adult tickets were sold as children tickets. How many of each type of ticket were sold for Mondays performance?

3. **For each of the following systems of inequalities with three inequalities, please solve the system by graphing method and expression the solution by shading the solution region. (SHOW ALL OF YOUR WORK.)**

   3. $-12x+4y \le 4$

      $-3x+6y \ge 18$

      $y<7$

4. $6x+2y>-4$

   $-4x+2y<2$

   $4x+8y>24$

5. **Use what you have learned about linear programing to minimize or maximize profits and costs in the following application problems given the constrants in each of the situations.**

   5. With the start of school approaching, a store is planning on having a sale on school materials. They have 600 notebooks, 500 folders, and 400 pens in stock, and they plan on packing it in two different forms. In the first package, there will be 2 notebooks, 1 folder, and 2 pens, and in the second one, 3 notebooks, 1 folder, and 1 pen. The price of each package will be $6.50 and $7.00 respectively. How many packages should they put together of each type to obtain the maximum benefit?

6. In order to ensure optimal health (and thus accurate test results), a lab technician needs to feed the rabbits a daily diet containing a minimum of 24 grams (g) of fat, 36 g of carbohydrates, and 4 g of protein. But the rabbits should be fed no more than five ounces of food a day. Rather than order rabbit food that is custom-blended, it is cheaper to order Food X and Food Y, and blend them for an optimal mix. Food X contains 8 g of fat, 12 g of carbohydrates, and 2 g of protein per ounce, and costs $0.20 per ounce. Food Y contains 12 g of fat, 12 g of carbohydrates, and 1 g of protein per ounce, at a cost of $0.30 per ounce. What is the optimal blend?