Wilf Csaplar Jr.   ECON/BUSI 205   Homework #8   **Due Friday 4/20**

Place your name on the back of this sheet of paper and nowhere else. Staple your answers on the front of this sheet of paper. Failure to follow these directions will cost you 10 points. If you use double-sided printing or write on the back of scrap paper, I will give you one additional point.

Show all work for all questions which have work.

1) (15 points) Set up the following equations in the form of **Ax=b**. Find **A^{-1}** and use that to solve the system. $Q_D = 120 - 2P$ and $Q_S = 11P - 10$.

2) (35 points) One of the questions on the exam was the following system of equations. The demand for umbrellas is given by $D_U = 20 + 2P_H + P_{RC} - 3P_U$. The demand for raincoats is given by $D_{RC} = 31 - 6P_H - 2P_{RC} + P_U$. The demand for hats is $D_H = 39 - 4P_H - P_{RC} + P_U$. If a store has 20 umbrellas, 10 raincoats, and 30 hats, what prices would mean supply equals demand for all three goods. However, this time I want you to set it up in the **Ax=b** format and solve it by finding **A^{-1}** and then multiplying the matrices appropriately.

3) (15 points) Another question from the exam started with the following. Suppose $1 worth of energy uses $.20 worth of energy and $.10 worth of food to feed the employees. $1 worth of food uses $.30 units of energy and $.150 worth of food. Set up the Leontief Input-Output Matrix. Assume you want to sell 1300 units of energy and 650 units of food. Use this information to set up the equations as **(I-A)x = b**. Use Cramer's Rule to find how much of each you need to make.

4) (35 points) Solve the following system of equations by setting them up as **Ax=b**, then finding **A^{-1}** and multiplying appropriately. $X + 3Y = 16$, $X + Z = 30$, and $Y + 2Z = 42$.