Wilf Csaplar Jr. Economics 205 Homework #9 **Due Wednesday 4/15 by 11:00 AM**

Do NOT write your name anywhere. (Canvas will tell me who turned in the assignment.) Take pictures of your answers and use your own software or https://pdfcandy.com/ to create a single PDF. (pdfcandy.com will convert JPG to PDF, resize PDF, merge PDF and just about anything else you can think of with a PDF for free.) Upload that to Canvas. Failure to follow these directions will cost you 10 points.

Show all work for all questions.

1) (55 points) On this question, be careful setting up your **A** matrix. Make sure you are consistent with which letter is first, second, and third. Suppose that producing \$1 of electricity uses 10¢ of electricity and 20¢ of gasoline. Producing \$1 of gasoline uses 10¢ of electricity and 20¢ of food. Producing \$1 of food uses 10¢ of gasoline and 20¢ of food. Create the Leontief input-output matrix, **A**. Find **I-A**. Then find $(\mathbf{I-A})^{-1}$. (Hint: Leave $\div|\mathbf{I-A}|$ outside the matrix, in other words, do not distribute it yet.) Suppose that you want to sell \$686 of electricity, \$1372 of gasoline, and \$686 worth of food. Set up $(\mathbf{I-A})^{-1}\mathbf{b}$ and do the multiplication to determine how much of each you need to produce to sell that much of each. (Hint: It does not matter which matrix you divide by $|\mathbf{I-A}|$.)

2) (15 points) Suppose that the supply curve is written as Q = -10 + 10P and the demand is Q=100 - P. Write it in the matrix form **Ax**=**b**. Use Cramer's rule to solve the system.

3) (15 points) Suppose that the supply curve is written as Q = -200 + 50P and the demand is Q=1000 - 10P. Write it in the matrix form **Ax**=**b**. Use Cramer's rule to solve the system.

4) (15 points) Suppose that the supply curve is written as Q = -100 + 5P and the demand is Q=180 - 2P. Write it in the matrix form **Ax**=**b**. Use Cramer's rule to solve the system.