Wilf Csaplar Jr. Economics 476 Homework #1 **Due Monday 8/24 by 3:00 PM**

Do NOT write your name anywhere. (Canvas will tell me who turned in the assignment.) Take pictures of your written answers and use your own software or https://pdfcandy.com/ to create a single PDF size A4. (pdfcandy.com will convert many file types to PDF, resize PDF, merge PDF and many other things for free. However, Apple phones may require using CamScanner before using pdfcandy.com.) Failure to follow these directions will cost you 10 points.

Show all work for all mathematical questions.

1) (20 points) What part of my webpage http://www.WCsaplarJr.info do you think is most helpful? Explain your logic. Is anything missing which would be helpful? If you were a Managerial Economics major, then which courses would you be taking *comps* in on Tuesday Morning? According to the boxes in yellow on my main page, which of the 25 most requested skills on LinkedIn are taught to our Economics majors?

2) (25 points) Suppose your utility function is given by $U(M, W) = M^{1/4}W^{1/2}$. If masks cost \$20 each and a container of wipes costs \$10, then what is the utility maximizing number of masks and wipes you would buy if you had \$120. Use Lagrangians to solve the problem. What is the marginal utility of \$1?

3) (25 points) Suppose labor costs \$5/L and capital costs \$10/K. You want to minimize your costs subject to producing at least 800 units. Your production function is given by $Q(L, K) = L^{1/3}K^{2/3}$. How much of each do you hire and what is your total cost? Use Lagrangians to solve the problem. What is the value of λ? What does that tell you?

4) (30 points) Suppose that your profit function is given by $P*Q - (Q^2 + Q + 10)$. Suppose the demand curve is written as $P = 16 - Q^{1/2}$. Using the demand curve as a constraint, i.e. NOT substituting it back into the function. Use Lagrangians to solve the problem. How many will be produced and at what price? I believe you will need a calculator and round off to the nearest whole number for Q and nearest penny for P. What is the value of λ? What does that tell you?