Wilf Csaplar Jr.   Economics 477   Homework #2   Due 09/11

Do not put your name anywhere on the assignment, other than on the back of this sheet of paper. Staple your answers on the front of this sheet of paper. Failure to follow these directions will cost you 1 point. Your assignment will be typed, except graphs can be drawn by hand and mathematical equations can be done by hand. Failure to type it will cost you 10 points. If you do double-sided printing or print on the back of scrap paper, I will give you one additional point.

1) (10 points each) For each of the following equations, determine if they are proper utility functions. Show all work. Do the long method for determining the "returns to scale".
A) $U(A, B, C) = A^{1/3}B^{1/3}C^{1/3}$
B) $U(D, E, F) = D^{1/2}F^{1/4}/E$
C) $U(G, H) = G^{1/2} + H^{1/2}$

2) (35 points) Maximize $U(J, K, L) = 12J^{1/3}K^{1/3}L^{1/6}$ subject to $4J + 2K = 104$ and $2J + K + 3L = 82$. Show all work. Approximately, how much would the utility increase if the 100 in the constraint increased to 101?

3) (25 points) If you were given a utility function of $U(M, N) = M^{1/3}N^{1/3}$ subject to $4M + 10N = 160$, what transformation could you do to simplify the calculations? Do that transformation and find the values for M and N which would maximize your utility.

4) (10 points) If your utility function was given by $U(P, Q) = P^{1/3} + Q^{1/3}$, could you do a transformation which would simplify it? If yes, do that transformation. If no, then explain what you would like to do and why you cannot do it.