Wilf Csaplar Jr.   Business 205   Homework #4   **Due Friday 9/28**

Place your name on the back of this sheet of paper and nowhere else. Staple your answers face up on the front of this sheet of paper. Failure to follow these directions will cost you 1 point. If you use double-sided printing or print on the back of scrap paper, I will give you one additional point.

1) (15 points) On page 209, there are two errors in the proof of the relationship between marginal revenue and elasticity. What are the errors? Rework the proof without the errors.

2) (15 points) Suppose the production function is given by $Q(L) = 20L^{1/2}$. Prove that there is no unconstrained global maximum.

3) (15 points) Suppose the profit function is given by $\Pi = -.01X^2 + 100X - 4$. Find the global maximum and global minimum if they exist. Determine whether it is a maximum or a minimum.

4) (20 points) Find all stationary points of the equation $f(X) = X^3 + 12X^2 + 48X - 10$. Did you find minima, maxima, or inflection points? Explain your logic.

5) (10 points) On page 214, the authors define the D and S functions. What are the units (dimensions) of D & S? How do you know? The equations give ranges for acceptable values for a_0, a_1, b_0, and b_1. Which of those ranges does not make economic sense? Why doesn't it?

6) (25 points) Suppose the demand function is given by $Q_D = 11 - P_C$ and the supply function is given by $Q_S = -4 + \frac{1}{2}P_S$. The tax rate is represented by t. What is the equation relating the two prices? What is the equation which says we are in equilibrium? Find the equation which determines the quantity produced at equilibrium as a function of t. What is the function for total tax revenue? Find the output which maximizes tax revenue. Prove it is a maximum not a minimum. For each step, show all work and briefly explain what you did.