Wilf Csaplar Jr. Business 205 Homework #9 **Due Monday 5/6**

The last one!

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.

Show all work on all questions.

1A) (10 points) Suppose the production function is given by $Q(L, K) = 2L^{1/2}K^{1/3}$. Find the slope of the isoquant at the point (9, 8).

1B) (10 points) Suppose the production function is given by $Q(L, K) = 64L^{3}K^{2}$. Find the slope of the isoquant at the point (9, 8).

2) (20 points) Suppose the utility function for cars (C) , houses (H), and desks (D) is given by $U(C,H,D) = 32C^{1/2}H^{1/4}D^{1/8}$. Find the functions for the MRS_{CH}, MRS_{CD} and MRS_{HD}. If we had 9 cars, 16 houses, and 1 desk, then how many houses would you be willing to trade for 1 car? Explain how you reached that conclusion. (Why would anybody want 9 cars and 16 houses?)

3) (10 points) Suppose that $U(E, M) = 4\left[.5E^{-4} + .5M^{-4}\right]^{-1/4}$ is the utility function as a function of the economics classes you take (E) and the mathematics classes you take (M). Find the slope of the indifference curve with E on the X-axis.

4) (20 points) Suppose $U(C, A) = 6A^{1/2}C^{1/3} + 6A^{1/3}C^{1/2}$. Find the slope of the indifference curve at the point (1, 64). Note that C is on the x-axis. Given your answer, how many apples would this person be willing to trade for a carrot? Briefly state how you reached that conclusion.

5) (15 points) For the equation $y = 3x^2 + 2xw + w^2 + 7$, find the first order total differentiation (dy) and the second order total differentiation (d^2y). What information does this give about the concavity of the function in the first quadrant?

6) (15 points) For the equation $y = -3x^2 - xw - 6w^2 + 13$, find the first order total differentiation (dy) and the second order total differentiation (d^2y). What information does this give about the concavity of the function in the first quadrant?