Wilf Csaplar Jr.   ECON/BUSI 205   Homework #3   **Due Friday 3/2**

Place your name on the back of this sheet of paper and nowhere else. Staple your answers on the front of this sheet of paper. Failure to follow these directions will cost you 10 points. If you use double-sided printing or write on the back of scrap paper, I will give you one additional point.

Show all work for all questions which have work.

1) (10 points) If the total cost function is $TC = 100 + 7Q + 2Q^{3/2}$, find MC and the slope of MC.

2) (10 points) Suppose the demand curve is given by $P = a - bQ$. Find the total revenue function. Find the MR function and prove it starts at the same point as the demand curve but with twice the slope.

3) (10 points) Use the quotient rule to find the slope of the ATC when $TC = 100 + 10Q + 3Q^2$.

4) (10 points) Suppose the GDP is given as $Y = 17e^{.03t}$. Find dY/dt and the instantaneous percent change in GDP. (The 17 is in trillions of dollars.)

5) (15 points) Suppose the total productivity of labor is given by $TPL(Q) = \ln(4Q^2)$. Find the slope of the MPL.

6) (15 points) Suppose we had $H(x) = F(x)/G(x)$. What is H'(x) using the quotient rule? Suppose we rewrote H(X) as $F(X)*[G(X)]^{1/2}$. Use the product rule and the chain rule to find H'(X). If done correctly, you should get the same answer.

7) (10 points each) Find the derivatives of the following.
A) $F(X) = 7 + 5X^{1/2} + X^3$
B) $F(X) = \ln(5X + X^2)$
C) $F(X) = (X^2 + 4X + 10)^{1/2}$