Wilf Csaplar Jr. Business 205 Homework #3 **Due Friday 2/22**

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 each) For each of the following functions, determine if it is differentiable by graphing it over the range indicated. Explain how you reached your conclusion.

A) $F(X) = \begin{cases} X + 3 & X < 4 \\ 2X - 1 & X \geq 4 \end{cases}$ over the range [0, 5]

B) $G(X) = \dfrac{X^2 + 3X + 4}{X - 1}$ over the range [0, 5]

2) (10 points each) For each part, find f'(X), i.e., df/dX. Show all work.

A) $f(X) = 6X^2 + 4X - 3$

B) $f(X) = (3X+2)(7X+6X^2)$

C) $f(U) = U^2+5$, and $U(X) = X^3$

D) $f(X) = \ln(5X^2 + 7X + 4)$

E) $f(X) = e^{5X+6}$

F) $f(X) = (X^2-1)/(X^2-4)$

3) (10 points) If $Y = f(X) = 4X^2 + 7X$, then find dX/dY. Show all work and briefly explain what you did.