ECO611 Homework 2 for Chapter 3 Exponential and Logarithmic Functions

Due: October 18 (Thursday) at 13:00

1. Assume a firm's net profits are $50 million in 2000 and are expected to grow at a steady rate of 6% per year through the end of the decade. How much would you expect the firm to earn in 2001? In 2003? Now assume that the firm's profits have been growing at 6% since 1997. If a negative value of n can be interpreted as the number of time periods before period t, how much did the company earn in 1998? Graph the path of income growth between 1998 and 2003 and explain why the curve gets steeper over time.

2. A bank is offering a deposit-incentive program that pays investors an 8% continuously compounding annual interest rate on any deposit over $100,000. Calculate the corresponding effective interest rate, or yield.

3. While you are a senior in high school, your parents decided to invest in the bond market to help pay for your college tuition. They purchase a bond that will pay $15,000 in one year plus an interest coupon payment of 7% of the bond's value when the interest rate on comparable assets is also 7%. What is the present value of this bond? If interest rates fall to 5% after the bond purchase, what is the present value of that same investment? What is the present value if interest rates rise to 9.5%?

4. Consider the production function, $Q = 15L^{4/5}K^{1/5}$ where Q is output, L is labor input, and K represents capital input. Using natural logarithms, transform this exponential function into a linear function. Now assume that L = 10 and K = 5. What is the value of ln(Q)? Determine the value of Q.

5. The housing price index in 1990 was 144.8, while its value in 1999 was 192.9 (the index is calculated such that it averaged 100 in the 1982 - 1984 period). What was the average annual continuously compounded inflation rate for housing costs between 1990 and 1999.