ECO 101A: Tutorial # 10

Date: 15/04/2017

1. A firm uses a single input, labor, to produce output q according to the production function $Q = 8 L^{1/2}$. The commodity sells for $150 per unit and the wage rate is $75 per hour.

   a) Find the profit-maximizing quantity of L.

   b) Find the profit-maximizing quantity of Q. What is the maximum profit?

   c) Suppose now that the firm is taxed $30 per unit of output and that the wage rate is subsidized at a rate of $15 per hour. Assume that the firm is a price taker, so the price of the product remains at $150. Find the new profit-maximizing levels of L, Q, and profit.

   d) Now suppose that the firm is required to pay a 20% tax on its profits. Find the new profit maximizing levels of L, Q, and profit.

2. Suppose you can buy a new Toyota Corolla for $20,000 and sell it for $12,000 after six years. Alternatively, you can lease the car for $300 per month for three years and return it at the end of the three years. Then you can lease another Corolla for another three years for the same monthly payment. For simplification, assume that lease payments are made yearly instead of monthly—i.e., that they are $3600 per year for each of three years. Compare leasing the car for two consecutive three-year periods against owning the car for six years.

   a) If the interest rate, r, is 4%, is it better to lease or buy the car?

   b) Which is better if the interest rate is 12%?

   c) At what interest rate would you be indifferent between buying and leasing the car?