ECO 101A: Tutorial # 7

Date: 21/03/2017

1. A number of stores offer film developing as a service to their customers. Suppose that each store offering this service has a cost function $C(q) = 50 + 0.5q + 0.08q^2$.

   a) Derive the marginal cost function. If the market price of film developing is $p = \$8.5$ per unit of roll of film, find the level of output produced by the firm. Find the level of producer surplus.

   b) If $p = \$8.50$, is the industry in long-run equilibrium? If not, find the price associated with long-run equilibrium.

   c) Suppose now that a new technology is developed which will reduce the cost of film developing by 25%. Assuming that the industry is in long-run equilibrium, how much would any one store be willing to pay to purchase this new technology?

2. Let the long run total cost function of a firm be $C = Q^3 - 6 Q^2 + 10 Q$. Let $Q = 20000 - 2P$ be the market demand function.

   a) Determine the long run equilibrium price.

   b) What is the equilibrium number of firms in the industry?

3. Suppose the competitive market for a good can be described by the following equations: Demand: $P = 10 - Q$, Supply: $P = Q - 4$ where P is the price in dollars per unit and Q is the quantity in thousands of units.

   a) What is the equilibrium price and quantity?

   b) Derive the level of social welfare associated with competitive equilibrium.

   c) Suppose the government imposes a tax of $1 per unit to reduce consumption of the good and raise government revenues. What will the new equilibrium quantity be? What price will the buyer pay? What amount per unit will the seller receive?

   d) What is the magnitude of deadweight loss associated with this tax intervention?

   e) Suppose the government has a change of heart about the importance of that taxed good to the happiness of the public. The tax is removed and a subsidy of $1 per unit granted to producers. What will the equilibrium quantity be? What price will the buyer pay? What amount per unit (including the subsidy) will the seller receive?

   f) What will be the total cost to the government to run the subsidy program?