

Discussion handout 10

Semester 1/2017

Question 1

a) Suppose that the investment function is given by $I(t) = e^t + t^{\frac{3}{5}}$. Suppose that the level of capital stock at the initial date is 75 units, find the function that governs the evolution of capital stock, i.e. $K(t)$.

b) Suppose that the marginal propensity to save function is given by

$$MPS = 0.7 - \frac{1}{\sqrt{Y}}$$

where Y is the level of aggregate income. Derive the consumption function when the level of autonomous saving is equal to 10. Find the level of consumption when income is equal to 100.

Question 2

Suppose that a monopolist faces with the demand function given by $P = 274 - Q^2$, and operates under the marginal cost function given by $MC = 4 + 3Q$.

a) Find the consumer's surplus at level of output and price that maximize the profit of the monopolist.

b) If the monopolist can choose the first degree price discrimination, calculate the level of output that the monopolist will choose to supply to the market. At the equilibrium level, how much is the total profit that the monopolist earns. (Hint: suppose that there is no fixed cost.)

Question 3

Suppose that market demand and market supply are given by $P = 25 - Q^2$ and $P = 2Q + 1$, respectively. Consider the following problems.

- a) Find the consumer surplus and producer surplus under the market equilibrium.
- b) Calculate the deadweight loss if the government has imposed tax by \$4 on consumer.

Question 4

Consider a non-linear market equilibrium model where market demand and market supply can be expressed by the following equations;

$$P_d = A Q_d^{-\alpha} \quad \text{and}$$

$$P_s = B Q_s^{\beta}$$

where both α and β are strictly greater than zero.

- a) Solve for the equilibrium price and equilibrium quantity
- b) Calculate the consumers' and the producers' surplus.

Suppose the government has implemented a year-end stimulus program by temporarily subsidizing each consumer by $k\%$ for every single dollar of transaction purchased from the producer. Consider the following problems

- b) Calculate the new equilibrium price and equilibrium quantity after the stimulus program is put in place.
- c) Recalculating the consumers' and the producers' surplus under the subsidy program.
- d) How much is the budget does the government need to prepare for the implementation of the subsidy program?
- e) Would the subsidy program be better-off or worse-off when we judge from the simple total surplus concept?