Intermediate Microeconomics
ECNS 301
Fall 2015

Homework #: 8

Due by the beginning of class on: Tuesday December 1, 2015

Name: ________________________________

Instructions:
There are 3 questions worth a total of 100 points. Answer each question clearly and concisely. You must show your work to receive credit. You are allowed to work with others, but all work must be your own.

Clearly print your name above and in the space provided on the next page. You must turn in both sides of this cover sheet along with your responses. You do not need to turn in the questions, only your responses with the cover sheet. All pages must be stapled to be graded.
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Perfect Competition

1. Suppose an industry consists of 100 identical perfectly competitive firms with the following cost function for each firm:

   \[ C = 128 + 69q - 14q^2 + q^3 \]

   (a) What is each firm’s short run supply function?

   (b) What is the industry short run supply function?

   (c) At a price of $60 for the final product, what is the industry price elasticity of supply and what is the each firm’s price elasticity of supply?

2. The city of Bozeman is concerned about rising rent for low income households. Several policies being considered. Suppose the cost function for building apartments is \( C(q) = 2500 + 400q + q^2 \), where \( q \) is the number of apartments a firm builds. The market for building apartments is perfectly competitive.

   (a) In the absence of any government intervention, what will be the long run price and quantity \( (q) \) built by each firm?

   (b) Demand for housing is given by \( P = 1000 - Q \), where \( Q \) is demand for housing in the whole city. How many apartments will Bozeman have \( (Q) \) in the long run?

   (c) How many firms will serve the market?

   (d) Suppose the government gives a $900 subsidy to each FIRM. What will be the new long run price and quantity \( (q) \) built by each firm?

   (e) How many apartments will Bozeman have with the per firm subsidy \( (Q) \)? How many firms will serve the market? What will be the cost to the government?

   (f) Instead suppose that the government gives a subsidy of $50 per apartment unit, what will be the long run price and quantity?

   (g) How many apartments will Bozeman have \( (Q) \) with the per apartment subsidy of $50 per apartment? How many firms will serve the market? What will be the cost to the government?

   (h) Now suppose that instead of subsidizing apartments, the government decides to build 50 apartment units. (Other firms are still free to also build apartments, but they are not subsidized.) What is the long run price of apartments? How many apartments will Bozeman have? How many firms will serve the market? What will be the cost to the government?
3. Sugar consumption is affected by the price of sugar. Let market demand and supply for sugar be:

\[ D(Q) = 50 - 2Q \]
\[ S(Q) = 10 + 3Q \]

(a) If a $2 tax is imposed on each pound of sugar, what are the effects of the tax on consumer surplus, producer surplus, and tax revenues?

(b) Suppose a quota is imposed to limit sugar consumption to the amount under the $2 tax. How large will that quota be and what will be the effects on consumers and producers?