In-class Practice questions for Perfect Competitive Market

0. Assume that a very large number of firms in an industry all have access to the same production technology. The total cost function associated with this technology is \( TC(q) = 40q - 24q^2 + 4q^3 \). If the demand function for the industry’s product is \( Q = 19 - P \), find numbers of firms when the market is at its LR competitive equilibrium?

1. Poland wants to privatize its farming industry and will therefore allow 10,000 farms to produce wheat under competitive circumstances. Assume that entry into the wheat-growing segment of the industry will be easy. Also assume that each wheat farm will have a total cost function of the following type: \( TC = \frac{q^2}{2} - 4q + 200 \), where \( q \) is the farm’s output. At the present, the government planners are setting a price of \( P = 20 \) per bushel for wheat.

   a) How much wheat will each farm produce? At the long-run perfectly competitive equilibrium for the wheat-growing segment of the farming industry, will the price be lower or higher than the present administered price? (Hint: remember the long-run conditions?? These conditions will help you find the competitive price)
b) If each wheat farm had ten acres before privatization and produced a yield of four
bushels per acre, should the size of these farms be increased or decreased after the
market becomes competitive? In other words, will it be cheaper to grow wheat on
larger or smaller farms when the market is competitive?

2. Assume that the taxi industry in the town of New City is perfectly competitive. Also
assume that the constant marginal cost of a taxi ride is $5 per trip and that each taxi is
capable of making 20 trips a day. We will let the demand function for taxi rides each day
be \( D(p) = 1,100 - 20p \).

a) What is the perfectly competitive price of a taxi ride?

b) How many ride will the citizens of New City make every day?

c) How many taxis will operate in New City?

Assume that every taxi that operates in New City has a special license. Therefore, the
number of such licenses is the same as the number of taxis that you calculated in Part c)
of this problem. Further assume that the demand for taxi rides has increased and is now
\( D(p) = 1,200 - 20p \). The cost of operating a taxi is still $5 per ride, and the number of
taxis has not changed.
d) Calculate the price that will equate demand with supply

e) Calculate the profit that each taxi will earn per day. (each taxi operates at its full capacity)

3. Suppose that there is an economy with two firms whose products are completely independent. By “independent,” we mean that when one firm changes its price, the other firm’s demand is totally unaffected. The only possibilities for employment in this economy are a career running firm 1 or firm 2 or a career as an economics professor who earns $20,000 a year. There are no barriers to entry in these careers, and anyone currently employed in one occupation can costlessly change to another.

The only input that either firm needs to make its product is seaweed, which costs $2 a pound. Each firm requires one pound of seaweed to produce one unit of its product. **The cost of the input (seaweed) does not include the cost of an entrepreneur’s time.** There are no costs involved in being an economics professor. The demand for the product of firm 1 is \( P_1 = 2,002 - 4Q_1 \), and the demand for the product of firm 2 is \( P_2 = 4,004 - 5Q_2 \).

a) If anyone can become an economics professor, what will the long-run equilibrium prices be for firm 1 and 2.
b) Is the price of each firm’s product forced down to the level of the marginal cost of the seaweed?

4. Consider an economy with the supply of soccer balls \( q^s = 4p \) and the demand for soccer balls given by \( q^d = 270 - 5p \).
   a) Calculate the equilibrium price and quantity.
   b) Graph the supply and demand functions.
   c) Calculate both the consumer and producer surplus.
Now suppose the government imposes a sales tax, such that consumers much pay $5 to the government each time they buy a soccer ball.

d) calculate the new equilibrium price and quantity.

e) Draw a graph marking the after tax consumer surplus and producer surplus as well as the tax revenue
f) Calculate the consumer surplus, the producer surplus, and the dead-weight loss.

g) Calculate the dead-weight loss imposed by the tax.