Introductory Microeconomics
Homework 4: Partial Equilibrium

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1. T/F. If demand is perfectly inelastic, then the equilibrium price is entirely determined by demand.

2. T/F. With free entry, the supply curve is perfectly elastic in the long run.

3. T/F. The market for insulin is likely to have an inelastic demand.

4. T/F. If two goods are substitutes, an increase in the price of one will decrease the demand for the other.

5. T/F. In a perfectly competitive market the sum of producer and consumer surplus is maximum.

6. Consider the market of a good. Supply and demand are given below.

$$Q_S(p) = p - 4 \qquad Q_D(p) = 100 - 3p$$

   (a) Plot them. Find the equilibrium price and quantity. Calculate the consumer surplus and the producer surplus. Calculate the total surplus.

   (b) Suppose demand shifts to $Q'_D(p) = 120 - 3p$. Find the new equilibrium price and quantity. What could have generated this shift?

   (c) Suppose instead. $Q'_S(p) = p - 12$. Repeat the previous question.

7. Consider a market in a long run equilibrium.

   (a) Plot the situation. Your plot should include the demand curve, the supply curve in the short run, and the supply curve in the long run.

   (b) Suddenly demand shifts right. Illustrate the change in the short run.

   (c) Assuming free entry (and free exit) of firms, illustrate the change in the long run.

8. Consider two similar markets. Demand is the same, but in the first one supply is perfectly inelastic and in teh second one it is perfectly elastic.

$$\text{Market 1: } Q_D(p) = 10 - p \qquad Q_S(p) = 5$$
$$\text{Market 2: } Q_D(p) = 10 - p \qquad p = 5$$

   (a) Calculate the equilibrium prices and quantities in both markets. Calculate the consumer surplus in both markets.

   Now there's a change in both markets. Demand shifts to $Q'_D(p) = 12 - p$.

   (b) Calculate the new equilibrium in both markets.

(c) Calculate the new consumer surplus in both markets. Can you explain the differences?

9. Two consumers have the following individual demands:

$$q_{D1}(p) = \begin{cases} 6 - p & \text{if} \quad p \leq 6 \\ 0 & \text{if} \quad p > 6 \end{cases} \qquad q_{D2}(p) = \begin{cases} 4 - p & \text{if} \quad p \leq 4 \\ 0 & \text{if} \quad p > 4 \end{cases}$$

(a) Plot them in two separate plots.

(b) Complete the following table to calculate the aggregate demand. $Q = q_1 + q_2$ is the aggregate demand.

p	q_1	q_2	Q
0			
1			
2			
3			
4			
5			
6			

(c) Plot the aggregate demand.

10. In a city labor supply and labor demand are described by the following equations:

$$L_D(w) = 200 - 10w \qquad L_S(w) = 15w$$

Where L represents the number of workers in thousands and w is the hourly wage.

(a) Find the equilibrium wage and number of workers in this economy.

(b) Suppose $w = 10$ instead. Find labor supply and labor demand for this wage. How many people are unemployed?

(c) Plot all your answers in the same diagram.