Econ 2016: Principles of Microeconomics

Homework 4 (Total score: 20 Points)

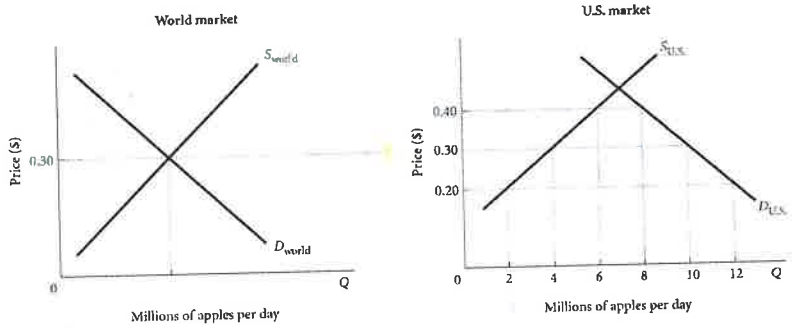
Due Date: Sept 19th, 12:40 PM

1. Multiple Choice (5 points)

C 1. (1 point) Refer to Figure 1. At the world price of 30 cents per apple, the United States imports _____ million apples per day.
A. 2 B. 4 C. 6 D. 10

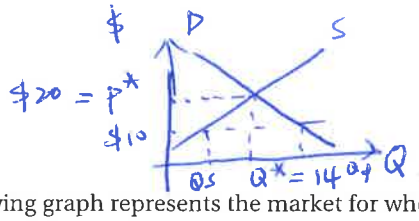
A 2. (1 point) If a 10-cent-per-apple tax is levied on imported apples, the United States will
A. import 2 million apples per day.
B. import 4 million apples per day.
C. import 6 million apples per day.
D. import 8 million apples per day.

Figure 1: Question 1.1



C 3. (1 point) An example of a price ceiling would be the government setting the price of sugar
A. above the equilibrium market price.
B. at the equilibrium market price.
C. below the equilibrium market price.
D. none of the above.

B 4. (2 points) If the market price of coffee is $3.00 per pound but the government will not allow coffee growers to charge more than $2.00 per pound of coffee, which of the following will happen?
A. Demand must eventually decrease so that the market will come into equilibrium at a price of $2.50.
B. There will be a shortage of coffee.
C. Supply must eventually increase so that the market will come into equilibrium at a price of $2.50.
D. The market will be in equilibrium at a price of $2.00.



2. Short Answer Questions (3 points): The following graph represents the market for wheat. The equilibrium price is $20 per bushel and the equilibrium quantity is 14 million bushels.

1. Explain what will happen if the government establishes a price ceiling of $10 in this market? What if the price ceiling is $30? (2 points)

   shortage of wheat

   ineffective. still in eqm.

2. Explain what will happen if the government establishes a price floor of $30 in this market? What if the price ceiling is $10? (1 points)

   floor

   surplus of wheat

   ineffective

3. Calculation. (12 points) Suppose the market demand for latte is given by $P = 6 - 2Q_d$, and market supply for latte is $P = 2 + 3Q_s$, where the unit for latte is 1000. (Please show your steps)

$Q_d = \frac{6-P}{2}$; $Q_s = \frac{P-2}{3}$

1. Please calculate the equilibrium price and equilibrium quantity. (2 points)

   $Q_d = Q_s \Rightarrow \frac{6-P}{2} = \frac{P-2}{3}$

   $\Rightarrow 18 - 3P = 2P - 4$

   $\Rightarrow 22 = 5P$

   $\Rightarrow P^* = 4.4$

2. Now, the government sets a price ceiling for coffee: Coffee shop could not set a price that is higher than $3. After implementing this price ceiling policy, how many units of shortage in latte will happen? (2 points) (Keep 1 decimal.)

   $P = \$3$

   $Q_d = \frac{6-3}{2} = 1.5$

   $Q_s = \frac{3-2}{3} \approx 0.3$

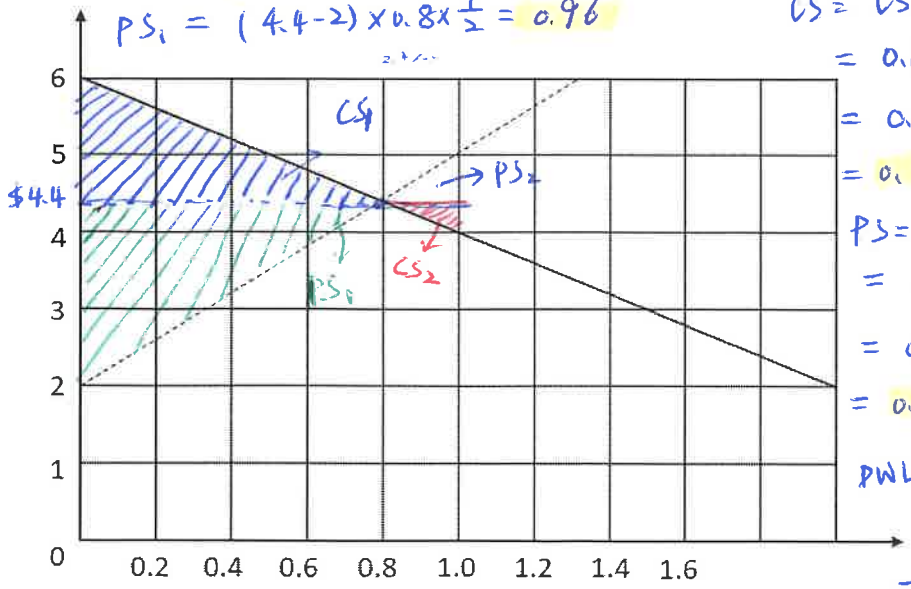
   Shortage $= Q_d - Q_s = 1.5 - 0.3 = 1.2$

3. Please calculate the consumer surplus, producer surplus in the equilibrium. (2 points)

4. Now, the government requires coffee shops over-produced coffee to $Q = 1$ (thousand). Please calculate the consumer surplus, producer surplus, and deadweight loss at $Q = 1$. (6 points) (Keep 1 decimal.)

   $\Rightarrow Q^* = \frac{6-4.4}{2} = 0.8$

Figure 2: Question 3 (units: 1000)



In eqm: $CS_1 = (6 - 4.4) \times 0.8 \times \frac{1}{2} = 0.64$

$PS_1 = (4.4 - 2) \times 0.8 \times \frac{1}{2} = 0.96$

Overproduce:

$CS = CS_1 - CS_2$

$= 0.64 - (4.4 - 4) \times (1 - 0.8) \times \frac{1}{2}$

$= 0.64 - 0.04$

$= 0.60$

$PS = PS_1 - PS_2$

$= 0.96 - (5 - 4.4) \times (1 - 0.8) \times \frac{1}{2}$

$= 0.96 - 0.06$

$= 0.9$

DWL = ~~Consumer surplus~~

= Total surplus in eqm

− Total surplus when the firm overproduces

$= (CS_1 + PS_1) - (CS_1 - CS_2 + PS_1 - PS_2)$

$= CS_2 + PS_2 = 0.1$