

ECON 0100 | Fall 2024 | Homework B1

Due: Friday Sept. 20

Homework is designed to both test your knowledge and challenge you to apply familiar concepts in new applications. Answer clearly and completely; use this sheet to show your work so you can later understand your thought process; you are welcomed and encouraged to work in groups as long as your work is your own. Submit your work on Gradescope when you're finished.

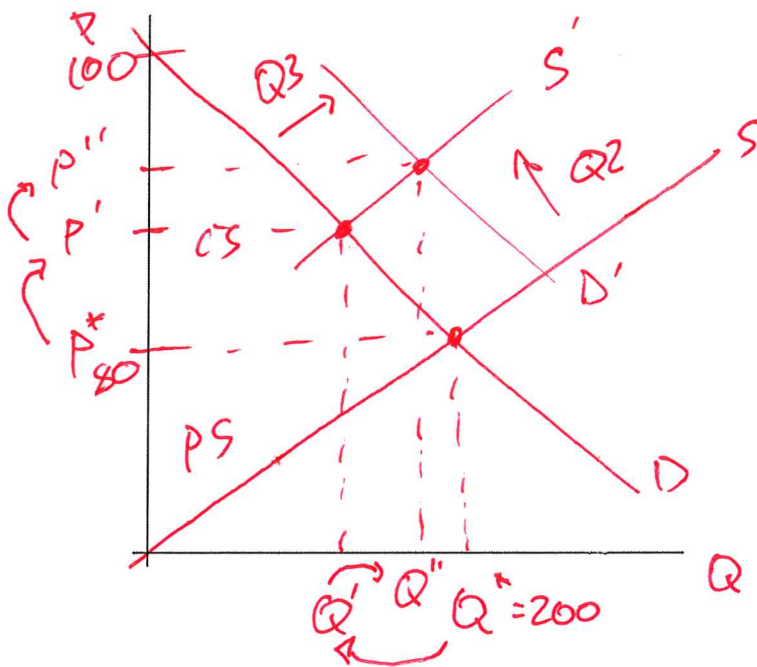
Dragontear

Dragontear is a rare and powerful substance is used in potions, spells, and fire-breathing, harvested from dragons while they laugh uncontrollably. The supply and demand equations for dragontear is known to be the following:

$$P_d = 100 - \frac{1}{10}Q_d \quad (2)$$

$$P_s = \frac{4}{10}Q_s \quad (3)$$

Prices are in galleons and quantity is in thousands of pasties. Use the graph below to guide your work.



$$100 - \frac{1}{10}Q = \frac{4}{10}Q$$

$$100 = \frac{1}{2}Q$$

$$Q^* = 200$$

$$P = \frac{4}{10} \cdot 200$$

$$P^* = 80$$

$$CS = 20 \cdot 200 \cdot \frac{1}{2} = 2000$$

$$PS = 80 \cdot 200 \cdot \frac{1}{2} = 8000$$

Q1. Equilibrium for Dragontear

Use the graph above to describe the market for Dragontear:

- Calculate equilibrium price: 20
- Find equilibrium quantity: 200
- Calculate consumer surplus: 2000
- Calculate producer surplus: 8000

Q2. Second Wizarding War

The second wizarding war limited the population of dragons. Use the graph above to aid your discussion of the impact the war had on the market for dragontear.

- The demand curve: *shifted in, stayed the same, shifted out*
- The supply curve: *shifted in, stayed the same, shifted out*
- The equilibrium price: *increased, stayed the same, decreased*
- The equilibrium quantity: *increased, stayed the same, decreased*

Q3. Widespread Rise in Spells

In the years after the war, many more in the wizarding world required dragontear as part of a widespread rise in the popularity of spells. On it's own (not including the change in the population of dragons), how has this change in popularity of spells change the market for dragonstear? Use the graph above to aid your discussion.

- The demand curve: *shifted in, stayed the same, shifted out*
- The supply curve: *shifted in, stayed the same, shifted out*
- The equilibrium price: *increased, stayed the same, decreased*
- The equilibrium quantity: *increased, stayed the same, decreased*

Q4. Post-War Equilibrium Changes

Without using numbers, how have these two changes together impacted the dragontear market equilibrium? Use the graph above to aid your discussion.

- Equilibrium price has: *increased, stayed the same, decreased, indeterminate*
- Equilibrium quantity has: *increased, stayed the same, decreased, indeterminate*

Q5. Post-War Welfare Changes

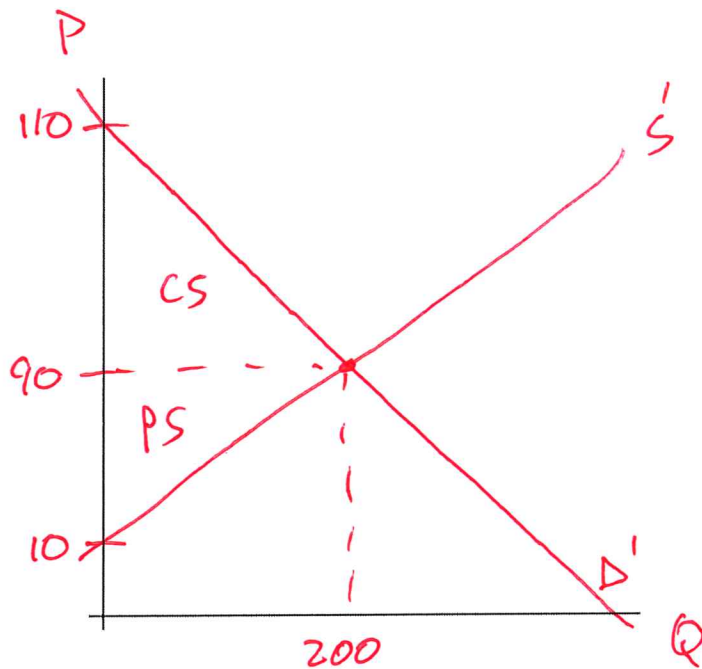
The supply and demand equations for dragon-tear after the post-war changes in Q2 and Q3 are known to be the following:

$$P_d = 110 - \frac{1}{10}Q_d \quad (6)$$

$$P_s = 10 + \frac{4}{10}Q_s \quad (7)$$

Use a graph to discuss how consumer surplus and producer surplus changed after the war.

- a. Consumer surplus after the war: ~~110~~ 2000
- b. Change in consumer surplus after the war: 0
- c. Producer surplus after the war: 8000
- d. Change in producer surplus after the war: 0



All that's happened here is that both the S and D curves are now higher and by the same amount, so the only thing that's changed is the price.