Monmouth COLLEGE

- Name: _____
- Date: _____
- Section: _____

ECON 300: Intermediate Price Theory

Problem Set #6 - Part #1

Fall 2024

Problem 1. Basic Equilibria

Suppose that the output market for good x is in perfect competition, and that the demand (Q_x^D) and supply (Q_x^S) functions are given as:

$$\begin{cases} Q_x^D = 500 - P_x \\ Q_x^S = 200 + 2P_x \end{cases}$$

1.A. State the five assumptions that define a perfectly competitive market.

1 .

2 .

3 .

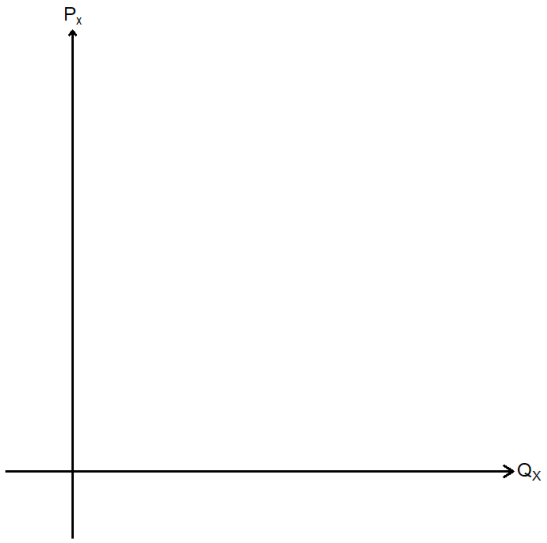
4 .

5 .

1.B. Find the equilibrium price (P_x^*) and quantity (Q_x^*).

- $P_x^* =$
- $Q_x^* =$

1.C. Plot the demand and supply curves in the empty chart. You must plot and label all elements clearly:



- The demand curve.
- The supply curve.
- The equilibrium price and quantity.
- ALL intercepts.

Problem 1. Basic Equilibria (continued)

Suppose that the output market for good x is in perfect competition, and that the demand (Q_x^D) and supply (Q_x^S) functions are given as:

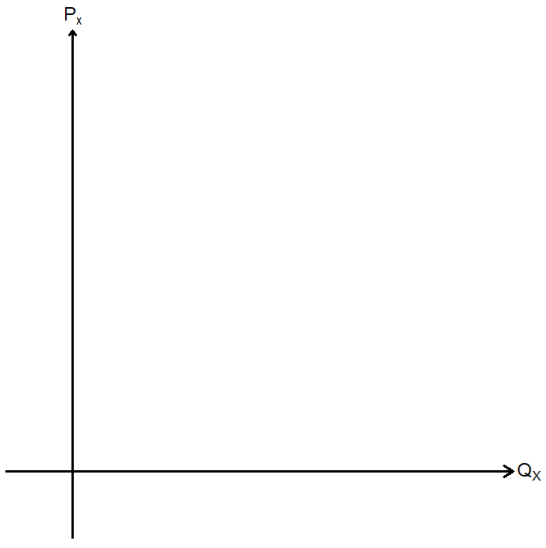
$$\begin{cases} Q_x^D = 500 - P_x \\ Q_x^S = 200 + 2P_x \end{cases}$$

1.D What is the value of consumer surplus and producer surplus in this market?

1.E Find the equilibrium price and quantity when the supply shifts to $Q_x^S = 2P_x$.

- $P_x^* =$
- $Q_x^* =$

1.F Plot the elements listed below in the empty chart. You must plot and label all elements clearly:



- The original demand curve.
- The new supply curve from `1.E`.
- The equilibrium price and quantity.
- ALL intercepts.
- Consumer surplus.
- Producer surplus.

Problem 2. Price Controls

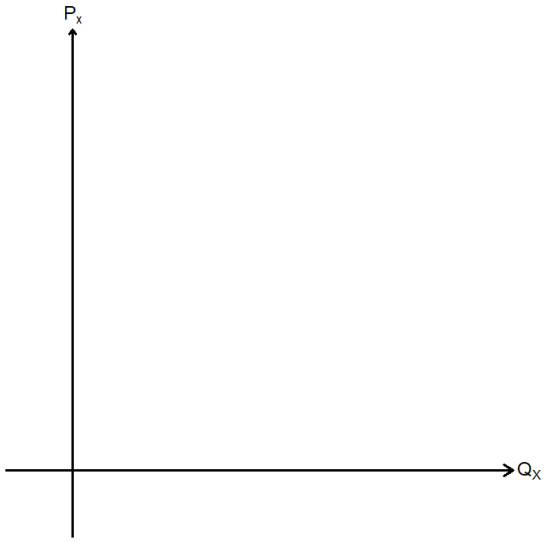
Suppose that the output market is in perfect competition with the same parameters as **Problem 1**. The demand (Q_x^D) and supply (Q_x^S) functions are given as:

$$\begin{cases} Q_x^D = 500 - P_x \\ Q_x^S = 200 + 2P_x \end{cases}$$

2.A The government sets a price ceiling of $\bar{P}_x = 80$. Is this price ceiling "binding?" Why?

2.B Find the market price and quantity traded in the market following the price control.

2.C Plot the effect of the price ceiling in the empty chart below. You must plot and label all elements clearly:



- The demand curve.
- The supply curve.
- The market price.
- The quantity traded in the market.
- ALL intercepts.

Problem 2. Price Controls (continued)

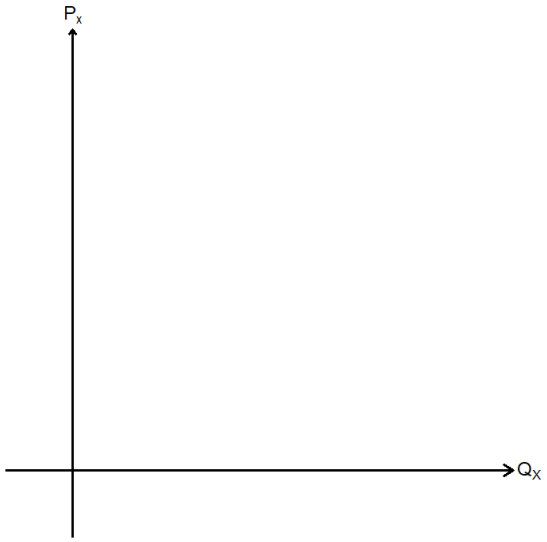
Suppose that the output market is in perfect competition with the same parameters as **Problem 1**. The demand (Q_x^D) and supply (Q_x^S) functions are given as:

$$\begin{cases} Q_x^D = 500 - P_x \\ Q_x^S = 200 + 2P_x \end{cases}$$

2.D What is the value of consumer surplus and producer surplus in this market?

2.E What is the value of deadweight loss in this market with price controls?

2.F Plot the elements listed below in the empty chart. You must plot and label all elements clearly:



- The demand curve.
- The supply curve.
- The market price.
- The quantity traded in the market.
- ALL intercepts.
- Consumer surplus.
- Producer surplus.
- Deadweight loss.

Problem 3. Taxation

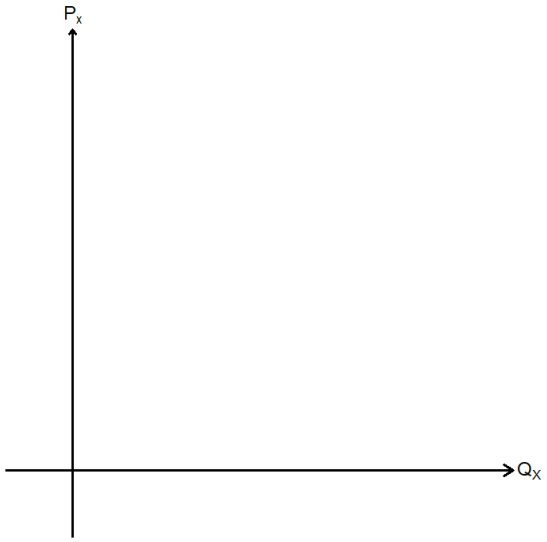
Suppose that the output market is in perfect competition with the same parameters as **Problem 1**. The demand (Q_x^D) and supply (Q_x^S) functions are given as:

$$\begin{cases} Q_x^D = 500 - P_x \\ Q_x^S = 200 + 2P_x \end{cases}$$

3.A What is the equilibrium price and quantity if the government imposes a \$5 per unit tax?

3.B What information do you need to determine whether the consumer or the producers bear a greater burden from taxation?

3.C Plot the effect of taxation in the empty chart below. You must plot and label all elements clearly:



- The demand curve.
- The supply curve.
- The market price.
- The quantity traded in the market.
- ALL intercepts.

Problem 3. Taxation (continued)

Suppose that the output market is in perfect competition with the same parameters as **Problem 1**. The demand (Q_x^D) and supply (Q_x^S) functions are given as:

$$\begin{cases} Q_x^D = 500 - P_x \\ Q_x^S = 200 + 2P_x \end{cases}$$

3.D What is the value of consumer surplus in this market with taxation?

3.E What is the value of producer surplus in this market with taxation?

3.F What is the value of deadweight loss in this market with taxation?

3.G What is the value of government revenue in this market with taxation?

- Score: _____
- Extra Credit: _____