

Problem Set 03

Instructions: Answers must be submitted online through the designated Canvas assignment. This Problem Set is due on **January 29 at 01:59pm**. Please write as legible and clearly as possible. You will not be given full credit if your answers cannot be easily understood.

Questions

1. Suppose we are in an autarky scenario and considering the market for an imported good at Home. Use the following demand and supply functions for solving the various equilibrium scenarios:

$$\text{Demand: } P = 120 - \frac{4}{7}Q_d$$

$$\text{Supply: } P = \frac{1}{4}Q_s$$

Consider the **Autarky Scenario** first

- (a) [3 points] Sketch the supply and demand curves, with the appropriate labeling for the equilibrium point and surplus regions.
- (b) [5 points] Report the coordinates of the equilibrium point, which represent the **price and quantity the market operates at**.
- (c) [3 points] Calculate the consumer and producer surplus values under autarky. What is the total welfare for the economy?

2. Using the same demand and supply functions as before, answer the following:

Demand: $P = 120 - \frac{4}{7}Q_d$

Supply: $P = \frac{1}{4}Q_s$

Suppose Home opens up to **free-trade** and becomes exposed to a world price, $P_w = 25$. Be sure to complete every part.

- (a) [3 points] Sketch the market with the **new price line** and corresponding equilibria points for **quantity demanded and supplied**.

- (b) [5 points] Calculate the equilibrium values for quantities, imports, and surplus values.

- (c) [3 points] What is the change in welfare, relative to **autarky**

3. Using the same demand and supply functions as before, answer the following:

Demand: $P = 120 - \frac{4}{7}Q_d$

Supply: $P = \frac{1}{4}Q_s$

Consider the case in which **the government intervenes, setting a tariff rate of $t = 4$** . Be sure to complete every part.

- (a) [3 points] Sketch the updated demand & supply curves. Label it properly and highlight which regions are the efficiency and dead-weight loss areas

- (b) [5 points] Calculate the equilibria for **quantity supplied, quantity demanded, imports, and surpluses (consumer, producer, government)**.

- (c) [3 points] What is the **change in welfare**, relative to free-trade?

| Variable | No Tariff | + Tariff on Final Good | + Tariff on Input Good |
|---------------------------------|-----------|------------------------|------------------------|
| Price of Domestic Final Good | 2220 | | |
| Value of Imported Inputs | 670 | | |
| Domestic Value-Added | 1550 | | |
| Effective Rate of Protection, % | 0 | | |

4. [10 points] Complete the table above and express the effective rate of protection in **each case**. **Tariffs on the final good are 25% and tariffs on the input good are 12%.** Show your work in the space provided below