

Directions: The homework will be collected in a box **before** the lecture. Please place your name, TA name and section number on top of the homework (legibly). Make sure you write your name as it appears on your ID so that you can receive the correct grade. Late homework will not be accepted so make plans ahead of time. **Please show your work.** Good luck!

Please realize that you are essentially creating “your brand” when you submit this homework. Do you want your homework to convey that you are competent, careful, professional? Or, do you want to convey the image that you are careless, sloppy, and less than professional. For the rest of your life you will be creating your brand: please think about what you are saying about yourself when you do any work for someone else!

1. Consider the market for clocks where the market demand and market supply curves are given by the equations below where P is the price per clock and Q is the quantity of clocks:

$$\text{Market Demand: } P = 250 - 10Q$$

$$\text{Market Supply: } P = 50 + (10/3)Q$$

a) Given the above information, find the equilibrium price and quantity in this market. Then calculate the value of consumer surplus (CS) and producer surplus (PS).

b) Draw a graph illustrating this market and in your graph identify the equilibrium price, equilibrium quantity, all intercepts, the area that is CS and the area that is PS.

Suppose that the government in this economy decides to impose an excise tax of \$80 per clock on producers of clocks.

c) Given this excise tax, write an equation that represents the supply curve in this market now that producers have this new additional cost.

d) Given this excise tax, find the new price consumers will pay for a clock in this market, the new price producers will receive for a clock in this market once they have met their legal obligation to the government to remit the excise tax, and the new equilibrium quantity of clocks that will be sold in this market.

e) Given this excise tax, calculate the value of consumer surplus with the tax (CSt), producer surplus with the tax (PSt), tax revenue the government receives from implementing the tax, consumer tax incidence (CTI), producer tax incidence (PTI), and the deadweight loss (DWL) due to the implementation of this excise tax.

f) Draw a graph illustrating this market and this excise tax. In your graph identify the price consumers pay for a clock now that the tax has been implemented, the price producers receive once they have paid the government the excise tax, the area of CSt, the area of PST, the area of CTI, the area of PTI, and the area of DWL.

g) Suppose that the government decides it wants to implement an excise tax in this market so that consumption of clocks falls to 3 units. Calculate the size of the excise tax that would be needed (assume that there is no initial excise tax) for the government to accomplish this goal. Show how you found your answer.

h) As the size of the excise tax increases, what happens to the area of DWL? Provide a verbal explanation and assume that the demand curve is downward sloping and the supply curve is upward sloping.

i) As the size of the excise tax increases, what happens to the level of tax revenue? This is a thought experiment-so provide a verbal explanation rather than a numeric answer. You might think about in this example what the tax revenue is when the excise tax is \$0 per clock and what the tax revenue is when the excise tax is \$200 per clock. Then, think about what must occur at excise taxes that are set between these two extremes.

2. Consider a small, closed economy whose market for pencils is described by the following demand and supply equations where P is the price per pencil and Q is the quantity of pencils:

$$\text{Domestic Demand: } P = 20 - (1/20)Q$$

$$\text{Domestic Supply: } P = (1/80)Q$$

a) Assume this market is a closed market. Find the equilibrium price, equilibrium quantity, the value of consumer surplus (CS), and the value of producer surplus (PS). Show your work.

Suppose this economy opens the pencil market to trade and that the world price is \$8 per pencil.

b) Verbally explain whether this small economy will import or export pencils given this information.

c) Now, provide a numerical value for your answer in (b). Make sure you show how you found your answer.

d) Suppose this market is still open to trade. Calculate the value of CS in the domestic economy when this market is open to trade (CStrade) and the value of PS in the domestic economy when this market is open to trade (PStrade).

e) Economists state that “trade is beneficial but has distributional consequences”. Explain this statement using your calculations in this problem as proof to support this statement.

3. Consider a small economy whose market for pencils is described by the following demand and supply equations where P is the price per pencil and Q is the quantity of pencils:

$$\text{Domestic Demand: } P = 20 - (1/20)Q$$

$$\text{Domestic Supply: } P = (1/80)Q$$

Suppose this economy opens the pencil market to trade and that the world price is \$2 per pencil.

a) Given this information and assuming that this domestic economy opens its pencil market to trade, find the value of imports, value of exports, value of consumer surplus with trade (CStrade), value of producers surplus with trade (PStrade), and the value of total surplus with trade (TStrade). Explain how you found your answers.

Suppose a tariff of \$1.00 per pencil is imposed on this good by the domestic economy’s government.

b) Given this tariff, find the values of the following items. Show how you found your answers.

Number of imports with tariff = _____

Number of exports with tariff = _____

Government tariff revenue = _____

$C_{\text{tariff}} =$ _____
 $P_{\text{tariff}} =$ _____
 DWL with tariff = _____

c) From the perspective of this domestic economy analyze the impact of this tariff. Who benefits from the tariff and how do they benefit? Who loses from the imposition of the tariff and what is their loss?

4. Consider a small economy whose market for dryers is described by the following demand and supply equations where P is the price per dryer and Q is the quantity of dryers:

Domestic Demand: $P = 500 - 10Q$

Domestic Supply: $P = 100 + 10Q$

The world price is \$150 for a dryer.

a) Suppose this is initially a closed economy. Find the equilibrium price and equilibrium quantity of dryers in this closed economy.

b) Now, suppose this economy opens its dryer market to trade. What will be the price of a dryer given this decision? Calculate the number of dryers produced by domestic producers, the number of dryers demanded by domestic consumers, the number of imported dryers into this economy, and the number of exported dryers from this economy. Show how you found your answers.

Suppose the government in this small domestic economy imposes an import quota of 20 dryers in this market once it is open to trade.

c) Given this import quota and the provided information, find the values for the following (make sure you explain how you got your answer!). Hint: you might find it helpful to draw a graph to guide your work.

Price with the import quota = _____

Quantity of Dryers demanded domestically with the import quota = _____

Quantity of Dryers supplied domestically with the import quota = _____

DWL due to the imposition of the import quota = _____

License Holder Revenue with the imposition of the import quota = _____

5. Consider the following demand curve for widgets where P is the price per widget and Q is the quantity of widgets.

Demand: $Q = 3000 - 3P$

a) Fill in the following table using the above information.

P	Q	Total Revenue = TR
\$0		
120		
180		
200		
250		
450		
600		
800		

b) In your own words describe what happens to total revenue if the price of this good goes from \$450 to \$600. In your answer make sure you include references to the price and quantity effects.

c) What is the maximum total revenue that could be earned given this demand curve and holding everything else constant? Assume that the supplier is free to set any price they want and their goal is to set their price to maximize their total revenue. Note: this price may not be in the table you just filled in!

6. Consider the following market demand and market supply curves for scissors where P is the price per scissor and Q is the quantity of scissors.

$$\text{Demand: } P = 11 - (1/100)Q$$

$$\text{Supply: } P = 2 + (1/200)Q$$

a) Given the above information find the equilibrium price and quantity in this market. Show your work.

b) Calculate the point elasticity of demand at equilibrium. Provide the general formula and show your calculations. Is demand elastic or inelastic? Explain your answer. Given this answer, will producers enhance their total revenue by increasing or by decreasing the price they charge for scissors?

c) Calculate the point elasticity of supply at equilibrium. Provide the general formula and show your calculations. Is supply elastic or inelastic? Explain your answer.

d) Suppose the price increases by \$1.00. Using the arc elasticity formula calculate the price elasticity of demand between the initial equilibrium and this new point on the demand curve. Provide the general formula and show your work. Is demand inelastic or elastic? Explain your answer.

7. a. You are told that the income elasticity of demand for bicycles is equal to 4. What does this mean if incomes in an economy increase by 20%?

b. You are told that the cross price elasticity of demand for bicycles and bike helmets is -2. What does this mean if the price of a bike helmet decreases by 10%?

c. You are told that the cross price elasticity of demand for bicycles and bus fares is equal to 1.5. What does this mean if the price of a bus fare increases by 5%?