

Directions:

- The homework will be collected in a box **before** the large 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. Comparative Advantage:

Robinson Crusoe is marooned on an island and only has two sources of food: the fish he can catch and the coconuts that he can find. Robinson spends a total of 10 hours a day either looking for food or developing a way off the island. In two hours, he can either catch one fish or find 3 coconuts.

- a. How many coconuts can Robinson find in one day (that is, what is the maximum number of coconuts that Robinson can find in one day)? How many fish can he catch?
- b. What is Robinson's opportunity cost of gathering one coconut? What is Robinson's opportunity cost of catching one fish?

One day, Robinson meets Wilson, who is also stranded on the island. Wilson also spends 10 hours a day catching fish and collecting coconuts. Wilson can either catch 4 fish in a day or gather 8 coconuts in a day. Wilson and Robinson would like to trade so that they can eat more than before they met each other.

- c. What is Wilson's opportunity cost of gathering an additional coconut? What is Wilson's opportunity cost of catching an additional fish?
- d. Who has the comparative advantage in gathering coconuts? Who has the comparative advantage in catching fish? Explain your answer.
- e. When Robinson and Wilson trade, what is the range of trading prices for one fish in terms of coconuts?

2. Shifts in Supply and Demand:

For the following scenarios, plot what will happen to the supply and demand curves for the given situation and state what will happen to the equilibrium price and quantity. Assume that each market is initially in equilibrium and then analyze the given scenario.

- a. The price of beef has risen due to an outbreak of Mad Cow Disease. Plot what will happen to the demand of pork, a substitute in consumption for beef.
- b. Scientists have released a study that shows that almonds are very unhealthy. Plot what will happen to the demand for almonds.
- c. Apple has improved the efficiency of the factories that produce iPhones. Plot what will happen to the supply of iPhones.
- d. The price of fertilizer used in growing wheat has risen by 50%. Plot what will happen to the supply of wheat.
- e. Since the Star Wars film has come out, Star Wars action figures are now much more popular and more companies have started to make these action figures. Plot what will happen to the Star Wars action figure market.
- f. Due to shifts in tastes, fewer people read news articles. The number of news outlets has increased due to the lower cost of disseminating news articles on the internet. Plot what will happen to the news article market.

3. Supply and Demand (Note: this problem is based on a similar one from K. Hansen's class-many thanks!)

Suppose the market demand and market supply curves for bicycles in Madison are given by the following equations, where P is price per bicycle and Q is quantity of bicycles:

$$\text{Market demand: } P = 300 - 5Q$$

$$\text{Market supply: } P = 2.5 Q$$

- a. Find the equilibrium price and quantity.
- b. Calculate the consumer and producer surplus in equilibrium.
- c. Imagine a price ceiling of \$50 is imposed in the market for bicycles. Given this intervention in the market and holding everything else constant, what are the values of the new consumer and producer surplus? What is the deadweight loss from this policy?
- d. Instead of a price ceiling, suppose that the Madison bicycle workers' union pushed for a price floor at \$150 in the market for bicycles. What are the values of the new consumer and producer surplus given this policy? What is the deadweight loss due to the implementation of this policy?

4. Supply and Demand II (Note: this problem is based on a similar one from K. Hansen's class-many thanks!)

Consider pumpkins sold at the local farmer's market. Suppose the demand for pumpkins is given by $Q = 100 - 2P$, and the supply is given by $Q = 2P - 20$.

- a. Find the equilibrium price and quantity.
- b. Calculate the consumer and producer surplus in equilibrium.
- c. Given the above information, what is the lowest price floor that will be effective?
- d. Given the above information, what is the highest price ceiling that will be effective?
- e. Suppose that the price of squash has risen 50% due to poor growing conditions for squash. Squash is a substitute for pumpkins. What is likely to happen to the equilibrium price and quantity in the market for pumpkins?

5. Price Supports and Guarantees

The market demand for economics textbooks is given by $P = 300 - 2Q$ and the supply of textbooks is given by $P = 2Q + 20$.

- a. What is the equilibrium price and quantity?
- b. Calculate the value of consumer and producer surplus when this market is in equilibrium.
- c. Suppose the government promises to buy textbooks at \$180 per textbook. How many textbooks will the government buy? How much will the government spend on textbooks?
- d. Given the government policy described in (c), how many textbooks will consumers buy? What is the value of consumer surplus? Will consumers like the price guarantee?
- e. Return to the original situation and now suppose that the government gives a \$20 subsidy to the publisher for every textbook sold. Given this new policy, how many textbooks will be sold and what will be the equilibrium price?
- f. Given the subsidy program described in (e), how much money will the government spend when implementing this program?
- g. Given the subsidy program described in (e), what is the value of consumer surplus? Do consumers prefer the subsidy program over the price guarantee program? Explain your answer fully.

6. Price Subsidies:

Suppose the market demand for a taxi ride to the airport is given by $P = 20 - Q$ and the supply of taxi rides to the airport is given by $P = 3Q$.

- a. What is the equilibrium price and quantity in the market for taxi rides to the airport?
- b. Calculate the value of consumer and producer surplus when this market is in equilibrium.

- c. Suppose the government now offers consumers \$4 to consumers for each taxi ride taken. What is the new equilibrium price and quantity?
- d. Given the government program described in (c), how much money does the government spend on this program?