Ec 11 Homework 1
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CALTECH

1. Suppose the demand for wheat is given by $q_d = 3 - p$, and the supply of wheat is given by $q_s = 2p$, where p is the price.
    a) Solve for the equilibrium price and quantity.
    b) Graph the supply and demand curves. What are the consumer surplus and producer profits?
    c) Now suppose supply shifts to $q_s = 2p + 1$. What are the new equilibrium price and quantity?
2. How will the following affect the price of a regular cup of coffee, and why?
    a) Droughts in Colombia and Costa Rica
    b) A shift toward longer work days
    c) The price of milk falls
    d) A new study that shows many great health benefits of tea
3. A reservation price is the maximum willingness to pay for a good that most people buy one unit of. Suppose in a market of t-shirts, 10 people have a reservation price of $10 and the 11^{th} person has a reservation price of $5. What does the demand "curve" look like?
4. In the exercise above, what is the equilibrium price if there were 9 t-shirts available? What if there were 11 t-shirts available? How about 10?
5. A consumer's value for slices of pizza is given by the following table. Graph this person's demand for slices of pizza.

Slices of pizza	Total value
0	0
1	4
2	7
3	10
4	12
5	11

Using the data from Friday's classroom experiment (location of the data TBA in class) to answer the following questions.

6. Plot the supply and demand from experiment 1.2. Which buyers and sellers are predicted to trade, and at what price?
7. Plot the supply and demand from experiment 1.4. Which buyers and sellers are predicted to trade, and at what price?
8. The gains from trade for buyers is called the consumer surplus. Compute the predicted consumer surplus and the actual consumer surplus for experiments 1.2 and 1.4.
9. The gains from trade for sellers is called profit. Compute the predicted and actual profits for these two experiments.
10. The sum of consumer surplus and profit is known as the gains from trade. What percentage of the possible gains from trade was achieved in 1.2 and 1.4?

1. Suppose the demand for wheat is given by $q_d = 3 - p$, and the supply of wheat is given by $q_s = 2p$, where p is the price.
    a) Solve for the equilibrium price and quantity.

        $3 - p = 2p$
        $p = 1, q = 2$

    b) Graph the supply and demand curves. What are the consumer surplus and producer profits?

        Consumer Surplus = 2
        Producer Profits = 1

    c) Now suppose supply shifts to $q_s = 2p + 1$. What are the new equilibrium price and quantity?

        $3 - p = 2p + 1$
        $p = 2/3, q = 7/3$

2. How will the following affect the price of a regular cup of coffee, and why?
    a) Droughts in Colombia and Costa Rica

        Droughts would decrease the supply of coffee beans, causing the coffee supply to decrease and prices to rise.

    b) A shift toward longer work days

        People would need more caffeine to get through each day, so demand would increase and prices would rise.

    c) Price of milk falls

        Milk is a complement, so a fall in the price of milk should increase the demand, increasing price and quantity of coffee.

    d) A new study that shows many great health benefits of tea

        Demand for tea, a substitute for coffee, would increase, causing coffee demand to decrease and prices to drop.

3. A reservation price is the maximum willingness to pay for a good that most people buy one unit of. Suppose in a market of t-shirts, 10 people have a reservation price of \$10 and the 11^{th} person has a reservation price of \$5. What does the demand curve look like?

Demand would have a constant value of $10 for the first 10 apartments and then drop vertically to $5.

4. In the exercise above, what is the equilibrium price if there were 9 t-shirts available? What if there were 11 t-shirts available? How about 10?

When there are 9 t-shirts, the price should be $10. When there are 11 t-shirts, the equilibrium price should be $5. Finally, with 10 t-shirts the price is anywhere between $5 and $10.

5. A consumer's value for slices of pizza is given by the following table. Graph this person's demand for slices of pizza.

Slices of pizza	Total value
0	0
1	4
2	7
3	10
4	12
5	11

With price on y-axis, graph should have a step function at y=4 from 0 to 1, y=3 from 1 to 3, y=2 from 3 to 4, and then drops to 0 at 4.