Exercise Session 5a before midterm

Problem 1

Imposing a new $10 downtown parking tax

a. would be a negative incentive that might have a positive result of reducing downtown congestion.

b. would be a positive incentive that might have a positive result of reducing downtown congestion.

c. would be a negative incentive that could only have negative results.

d. None of the above is true.

Problem 2

Which of the following would not cause the demand curve for college football tickets to shift?

a. an increase in the price of professional football tickets.

b. a decrease in the price of college basketball tickets.

c. an increase in the price of college football tickets.

d. a drop in student incomes.

Problem 3

The slope of the demand curve and the price elasticity of demand are

a. basically the same thing.

b. **different because the slope is based on absolute changes and elasticity is based on percentage changes**.

c. are derived from production and distribution costs.

d. determined by supply.

Problem 4

Describe the role of prices in the market economies.

Answer: Prices play a vital role in market economies because they bring markets into equilibrium. If the price is different from its equilibrium level, quantity supplied and quantity demanded are not equal. The resulting surplus or shortage leads suppliers to adjust the price until equilibrium is restored. Prices thus serve as signals that guide economic decisions and allocate scarce resources.

Problem 5

How might a drought that destroys half of all farm crops be good for farmers? If such a drought is good for farmers, why don't farmers destroy their own crops in the absence of a drought?

Answer: A drought that destroys half of all farm crops could be good for farmers (at least those unaffected by the drought) if the demand for the crops is inelastic. The shift to the left of the supply curve leads to a price increase that will raise total revenue if the price elasticity of demand is less than 1.

No one farmer would have an incentive to destroy her crops in the absence of a drought because she takes the market price as given. Only if all farmers destroyed a portion of their crops together, for example through a government program, would this plan work to make farmers better off.

Problem 6

TRUE/FALSE

Innovations in the production of batteries lead to a rightward shift in the market supply for hybrid cars, while demand stays the same. Since this leads to a decrease in the equilibrium price and an increase in the equilibrium quantity, demand is more inelastic at the new equilibrium.

This is true in the case of linear demand, since elasticity of demand is increasing in price along a linear demand curve (in our lectures, we typically assume linear curves). However, this is false in the case of a constant elasticity demand curve.

Problem 7

When market demand and supply shift in opposite directions, we can unambiguously say how the equilibrium price and quantity change.

False. When demand and supply shift in the opposite direction we can unambiguously say how the equilibrium price changes (equilibrium price increases if supply shifts to the left and demand shifts to the right and vice versa). However, the effect on equilibrium quantity is ambiguous; it could either increase or decrease in both cases.

Problem 8

Consider the market for apple juice. In this market, the supply curve is given by

$Q_S = 10P_J - 5P_A$ and the demand curve is given by $Q_D = 100 - 15P_J + 10P_T$, where J denotes apple juice, A denotes apples, and T denotes tea.

(a) Assume that P_A is fixed at $1 and P_T = 5. Calculate the equilibrium price and quantity in the apple juice market.

We have the system of equations Q = 10PJ − 5 · 1 and Q = 100 − 15PJ + 10 · 5. Solving for P_J and Q we get that P_J = 6.2 and Q = 57.

(b) Suppose that a poor harvest season raises the price of apples to P_A = 2. Find the new equilibrium price and quantity of apple juice. Draw a graph to illustrate your answer.

We now have to solve the system:

$$\begin{cases} Q = 10P_J - 10 \\ Q = 150 - 15P_J \end{cases}$$

Solving for P_J and Q we get that P_J = 6.4 and Q = 54. In a supply and demand graph, the supply curve shifts to the left, resulting in the higher equilibrium price and lower equilibrium quantity.
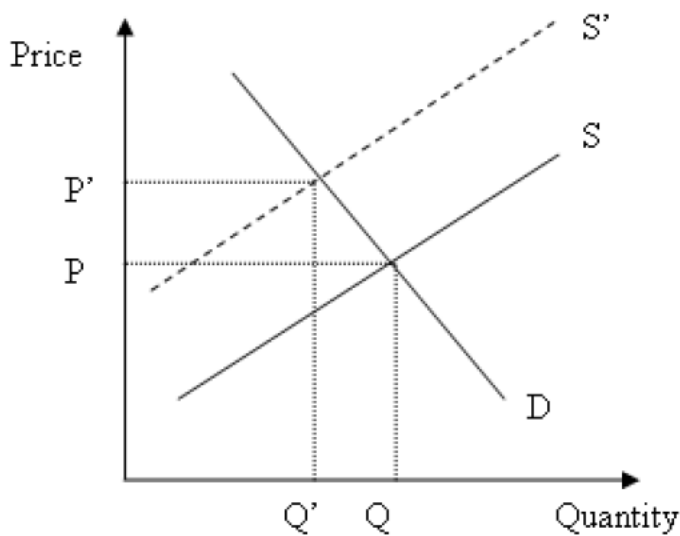
(c) (8 points) Suppose $P_A = 1$ but the price of tea drops to $P_T = 3$. Find the new equilibrium price and quantity of apple juice. $Q = 10P_J - 5$, $Q = 130 - 15P_J \longrightarrow P_J = 5.4$, $Q = 49$.

(d) (8 points) Suppose $P_A = 1$, $P_T = 5$, and there is a price ceiling on apple juice of $P^* = 5$. What is the excess demand for apple juice as a result? Draw a graph to illustrate your answer.

Note that the price ceiling will be binding, since the equilibrium price from (a) is $P_J = 6.2$. Plugging the price ceiling level into the supply and demand equations we get that $Q_S = 45$ and $Q_D = 75$. Hence, there will be excess demand for apple juice of $Q_E = 30$.
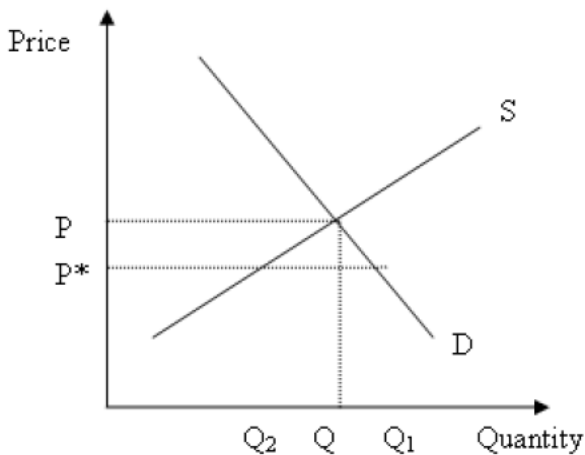
Problem 9

Ann and Bob are a couple. They are the only people in the family. Bob's 1 inverse demand curve for shirts is $P = 5 - \frac{1}{2}Q_B$. Ann's inverse demand curve for shirts is $P = 10 - 2Q_A$. What is their

family demand function for shirts? Calculate their family consumption of shirts when the price is 4 and 6, respectively.
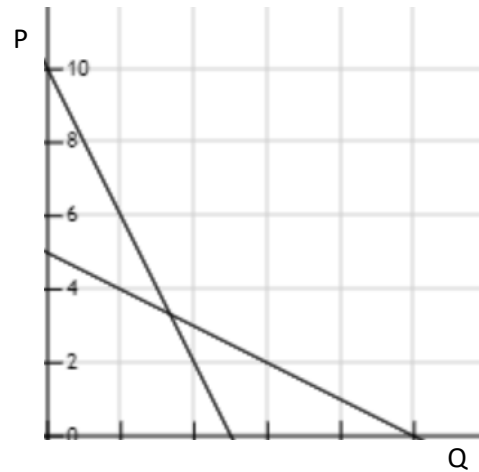
When 5 ≤ P < 10 , only Ann buys shirts, and when P < 5 , both of them buy shirts. Therefore, the family demand function is

$$Q_{family} = \begin{cases} 5 - \dfrac{1}{2}P, if\ 5 \le P < 10 \\ 15 - \dfrac{5}{2}P, if\ 0 \le P < 5 \end{cases}$$

Where the second equation is derived by $Q_{family} = Q_A + Q_B$. They consume 5 shirts when P=4 and consume 2 shirts when P=6.

Problem 10

Jane drives to work every day and she spends a lot of money in parking meters. Many days the thought of cheating and not paying for parking crosses her mind. However, she knows that there is a ¼ probability of being caught in a given day if she cheats, and that the cost of the ticket is $36. Her daily income is $100. What is the maximum amount of money she will be willing to pay for one day parking? [Hint: by paying that amount she avoids the risk of getting a ticket!].

Assuming a linear utility function of Jane

If Jane decides to cheat, she gets:

$$0.25 * 64 + 0.75 * 100 = 91\$$$

If she decides to pay the fee x, she gets:

100-x

She is indifferent between cheating and paying the fee when

100-x=91$, therefore when the fee $x \leq 9$\$, she will be willing to pay for the parking.

Problem 11

Assume that England and Spain can switch between producing cheese and producing bread at a constant rate.

	Labor Hours Needed to Make 1 Unit of		Number of Units Produced in 40 Hours	
	Cheese	Bread	Cheese	Bread
England	1	4	40	10
Spain	4	8	10	5

i) The opportunity cost of 1 unit of cheese for England is
- **a. 1/4 unit of bread.**
- b. 1 hour of labor.
- c. 4 units of bread.
- d. 4 hours of labor.

ii) The opportunity cost of 1 unit of bread for Spain is
- a. 1/2 unit of cheese.
- b. 1/2 hour of labor.
- **c. 2 units of cheese.**
- d. 8 hours of labor.

iii) England has an absolute advantage in the production of
- a. cheese and Spain has an absolute advantage in the production of bread.
- b. bread and Spain has an absolute advantage in the production of cheese.
- **c. both goods and Spain has an absolute advantage in the production of neither good.**
- d. neither good and Spain has an absolute advantage in the production of both goods.

Problem 12

Suppose Spencer and Kate are the only two demanders of lemonade. Each month, Spencer buys six glasses of lemonade when the price is $1.00 per glass, and he buys four glasses when the price is $1.50 per glass. Each month, Kate buys four glasses of lemonade when the price is $1.00 per glass, and she buys two glasses when the price is $1.50 per glass. Which of the following points is on the market demand curve?

Point	Price	Quantity
A	$1.00	4
B	$1.00	10
C	$1.50	2
D	$1.50	6

a. B only

b. B and D only

c. A and C only

d. D only

Problem 13

Which of the following might cause the demand curve for an inferior good to shift to the left?

    a. a decrease in income

    b. an increase in the price of a substitute

    c. an increase in the price of a complement

    d. None of the above is correct.

Problem 14

The demand schedule below pertains to sandwiches demanded per week.

Price	Harry's Quantity Demanded	Darby's Quantity Demanded	Jake's Quantity Demanded
$3	3	4	3
$5	1	2	x

i) Regarding Harry and Darby, whose demand for sandwiches conforms to the law of demand?

    a. only Harry's

    b. only Darby's

    c. both Harry's and Darby's

    d. neither Harry's nor Darby's

ii) Suppose x = 1. Then it must be true that

    a. Harry and Jake have the same income, which is lower than Darby's income.

    b. if sandwiches and potato chips are complements for Harry, then those two goods are also complements for Jake.

    c. Harry's demand curve is identical to Jake's demand curve.

    d. All of the above are correct.

iii)   Suppose x = 1. What is the slope of the market demand curve? **-1/3**

iv)   Suppose Harry, Darby, and Jake are the only demanders of sandwiches and that the market demand violates the law of demand. Then, in the table, the value of x must be

      a. less than or equal to 5.

      b. greater than or equal to 5.

      c. greater than or equal to 7.

      d. greater than or equal to 10.

v) Suppose Harry, Darby, and Jake are the only demanders of sandwiches. Also suppose the following:

      • x = 2.

      • The current price of a sandwich is $5.00.

      • The market quantity supplied of sandwiches is 10.

      • The law of supply applies to the supply of sandwiches.

      Then there is a

      a. shortage of 5 sandwiches, and the price would be expected to rise from its current level of $5.00.

      b. shortage of 5 sandwiches, and the price would be expected to fall from its current level of $5.00.

      c. surplus of 5 sandwiches, and the price would be expected to rise from its current level of $5.00.

      d. surplus of 5 sandwiches, and the price would be expected to fall from its current level of $5.00.

vi) Suppose Harry, Darby, and Jake are the only demanders of sandwiches. Also suppose the following:

      • x = 2.

      • The current price of a sandwich is $3.00.

      • The market quantity supplied of sandwiches is 4.

      • The slope of the supply curve is 2.

      Then there is currently a

      a. shortage of 6 sandwiches, and the equilibrium price of a sandwich is less than $3.00.

      b. shortage of 6 sandwiches, and the equilibrium price of a sandwich is $5.00.

      c. surplus of 6 sandwiches, and the equilibrium price of a sandwich is less than $3.00.

      d. surplus of 6 sandwiches, and the equilibrium price of a sandwich is $5.00.

When the price is 3$, quantity supplied is 4, when the price is 4$, quantity supplied is s'

Where $s' = \frac{4-3}{s'-4} = 2 \Rightarrow s' = 4.5$, when the price is 5$, quantity supplied is s''

Where $s'' = \frac{5-3}{s''-4} = 2 \Rightarrow s'' = 5$, Therefore, when price is 5$, we have an equilibrium, where price=5$ and quantity=5 units

Problem 15

What will happen to the equilibrium price and quantity of new cars if the price of gasoline rises, the price of steel rises, public transportation becomes cheaper and more comfortable, and auto-workers negotiate higher wages?

      a. Price will fall, and the effect on quantity is ambiguous.

b. Price will rise, and the effect on quantity is ambiguous.

c. Quantity will fall, and the effect on price is ambiguous.

d. Quantity will rise, and the effect on price is ambiguous.

Problem 16

What would happen to the equilibrium price and quantity of lattés if coffee shops began using a machine that reduced the amount of labor necessary to produce steamed milk, which is used to make lattés, and scientists discovered that coffee prevents heart attacks?

a. Both the equilibrium price and quantity would increase.

b. Both the equilibrium price and quantity would decrease.

c. The equilibrium price would increase, and the effect on equilibrium quantity would be ambiguous.

d. The equilibrium quantity would increase, and the effect on equilibrium price would be ambiguous.

Problem 17

Using the midpoint method, the price elasticity of demand for a good is computed to be approximately 0.75. Which of the following events is consistent with a 10 percent decrease in the quantity of the good demanded?

a. a 7.5 increase in the price of the good

b. a 13.33 percent increase in the price of the good

c. an increase in the price of the good from $7.50 to $10

d. an increase in the price of the good from $10 to $17.50

Problem 18

Some firms eventually experience problems with their capacity to produce output as their output levels increase. For these firms,

a. market power is substantial.

b. supply is perfectly inelastic.

c. supply is more elastic at low levels of output and less elastic at high levels of output.

d. supply is less elastic at low levels of output and more elastic at high levels of output.

Problem 19

Suppose buyers of vodka are required to send $5.00 to the government for every bottle of vodka they buy. Further, suppose this tax causes the effective price received by sellers of vodka to fall by $3.00 per bottle. Which of the following statements is correct?

a. This tax causes the demand curve for vodka to shift downward by $5.00 at each quantity of vodka.

b. The price paid by buyers is $2.00 per bottle more than it was before the tax.

c. Sixty percent of the burden of the tax falls on sellers.

d. All of the above are correct.

Problem 20

The mayor of Workerville proposes a local payroll tax to fund a new water park for the city. The mayor proposes to collect half the tax from workers and half the tax from firms. The mayor will be able to successfully divide the burden of the tax equally if the

e. demand for labor is more elastic than the supply of labor.

f. supply of labor is more elastic than the demand for labor.

g. demand for labor and supply of labor are equally elastic.

h. It is not possible for the tax burden to fall equally on firms and workers.