Exam One Name_____
PAI 723 October 11, 2017
The total exam is worth 20 points. Each question is worth 2 points, and each sub question is worth an equal share of the two points.

1) Taxes.

   a. Illustrate on a graph the impact of a specific tax placed on consumers. First, identify the original pre-tax equilibrium price-quantity pair. Then for the post tax scenario identify: the price paid by consumers, the price received by producers, the size of the tax revenue, and the quantity supplied / demanded.

   b. Illustrate on a graph the impact of an ad valorem tax placed on consumers. First, identify the original pre-tax equilibrium price-quantity pair. Then for the post tax scenario identify: the price paid by consumers, the price received by producers, the size of the tax revenue, and the quantity supplied / demanded.

   c. Briefly explain the concept of consumer incidence using the graph you drew for (b).

2) If $p_1 = 10$, $p_2=10$, and $Y=400$
   a. Draw the budget constraint.

   b. Show how you can derive the price consumption curve for a given consumer's preferences (drawn as you like so long as they obey the properties of indifference curves discussed in class) using: $p_1 = 5$ all else constant, the $p_1 = 10$ line you drew for (a), and $p_1 = 20$ all else constant.

   c. Show how to derive the individual's demand curve from the graph in (b).

3) The demand curve is given to you as Q=100-20*p.
    a. Fill out the following table (use the relatively higher price / relatively lower quantity pair in the elasticity calculation).

Price	Quantity	Elasticity
$1.00		----------
$1.50		
$2.00		
$2.50		
$3.00		

    b. Draw this demand curve with price on the y-axis and quantity on the x-axis. Identify the range over which the demand curve is inelastic and over which it is elastic.

4) I know the price of apples is $1.00 per unit and the price of bananas is $0.50 per unit. At the bundle the consumer is considering consuming the marginal utility of apples is 4 and the marginal utility of bananas is 3. This bundle is on the budget line.

   a. Explain why the bundle the consumer is considering buying is not the optimal bundle.

   b. Is the optimal bundle going to be composed of more apples and fewer bananas or fewer apples and more bananas than the bundle under consideration? Illustrate using a graph and explain your reasoning below the graph.

5) You are given that p=80-2*q is the inverse demand curve and p=30+8*q is the inverse supply curve.

a. What is the equilibrium price quantity pair if the market is perfectly competitive?

b. Illustrate and describe the impact of a price floor set at $78.

c. Illustrate and describe the impact of a price ceiling set at $78.

6) A student has a stipend that pays her $2,250 per month and she spends it on two goods: food and education. The price of one unit of education per month is $250. The price of one unit of food per month is $25. She just got an additional award that will give her $250 more per month, but this additional money can only be used on education.

a. Illustrate her original budget line and her budget line after she receives the award.

b. Illustrate using indifference curves how she could be made even better off if the grant had been given in cash and unconstrained in how she uses it compared to having it constrained to be spent only on education (a person for **whom it does matter**.)

7) Say that you know that the inverse demand curve for umbrellas is: $p=30 - 2Q_d$ (where p is the price per umbrella and Q_d is the quantity of umbrellas demanded), and the (inverse) supply curve can be expressed in a similar fashion by $p=Q_s -3$

   a) What is the equilibrium price quantity pair if the market for umbrellas is perfectly competitive?

   b) If a specific tax of $3.00 is put on producers per umbrella, what will be the new equilibrium quantity, price consumers pay, and price sellers get?

   c) What is the incidence of tax on consumers in this case?

8) Compared to last year, the quantity purchased of red beans has dropped in the United States this year. The United States Department of Agriculture (USDA) argues that this was a poor year for red bean production due to an outbreak of bean mosaic virus spread by aphids. The US Dry Bean Association argues that the quantity of red beans demanded has decreased due to technological innovation in lentil production that decreased the price per kilogram of lentils by 40% from this time last year.

a. Graph USDA's argument on a supply and demand graph for red beans.

b. Graph US Dry Bean Association's argument on a supply and demand graph for red beans.

a. Which explanation is more consistent with the facts if the price of red beans increased 5% over the past year? Justify your answer.

9) Circle whether the statement is true of false:

a. A change in consumer income causes a shift in the demand curve.
TRUE FALSE

b. The Marginal Rate of Transformation changes if one price changes while income and the other price are held constant.
TRUE FALSE

c. A good for which the price elasticity of demand is inelastic has a larger percent change in quantity than the corresponding percent change in price.
TRUE FALSE

d. Indifference curves slope upward if the two goods in question are substitutes.
TRUE FALSE

e. In a two good world, both goods must be normal to avoid violating the "more is better than less" assumption about preferences.
TRUE FALSE

f. The cross price elasticity for a complement is positive.
TRUE FALSE

g. A negative income elasticity means the total effect is less than the substitution effect in response to a change in the price of the good all else constant.
TRUE FALSE

h. In a corner solution of a two commodity world, the consumer consumes zero amount of one of the commodities and allocates all of their income to the other commodity.
TRUE FALSE

10) The Museum of Science and Technology is considering raising the price of an annual family membership from $60 to $69. If the number of annual family memberships currently sold is 15,000 and the best available information suggests that the short run price elasticity of demand for annual family memberships is -1.1, answer the following questions.

a. What is the predicted membership level after the price is raised in the short run?

b. Compare total revenue from annual family memberships at a price of $60 with total revenue at a price of $69 given you answer to (a). Which price leads to higher total revenue in the short run?

c. If -1.1 is the short run price elasticity of demand and the long run price elasticity of demand is -2.0, what will be the long run membership level and revenue if the price is raised to $69?