Exam One Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

PAI 723, Fall 2021

Professor John McPeak

The total quiz is worth 20 points. Each question is worth 2 points, and each sub question is worth an equal share of the two points.

1. The demand curve is given to you as Q=110-20\*p.
   1. 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 |  |  |

* 1. 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.

1. Taxes. In all cases, describe the original pre-tax equilibrium price quantity pair, and following imposition of the tax the price paid by consumers, the price received by producers, the size of the tax revenue, and the quantity supplied / demanded.
   1. Illustrate on a graph the impact of a specific tax placed on producers.
   2. Illustrate on a graph the impact of an ad valorem placed on consumers.
   3. Explain the concept of consumer incidence with reference to the graph you drew for part b above.

3) You are given that p=70-q is the inverse demand curve and p=20+4\*q is the inverse supply curve.

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

b. Illustrate on a graph and describe the impact of a price floor set at $64.

c. Is this price floor ‘binding’ or ‘non-binding’? In answering, explain what is meant by these terms.

4) The Mario Cuomo bridge (Tappan Zee if you prefer) north of NYC currently has an average daily traffic of 140,000 crossings per day. The New York State Thruway authority announced that the toll for crossing that is currently $5.25 will increase to $5.75 in 2022. The Bureau of Transport Statistics reports that the short run price elasticity of demand for tolled bridges is -0.89.

a. What is the predicted number of crossings per day after the toll is raised?

b. Compare total revenue per day for the Thruway Authority at the $5.25 level and the $5.75 level. Which is higher?

1. The Bureau of Transport Statistics also reports that the long run price elasticity of demand for tolled bridges is -1.41. What will be the estimated number of crossings per day and the revenue per day for the Thruway Authority in the long run?
2. I know the price of processed pork is $3.00 per unit and the price of avocados is $2.00 per unit. I also know that the marginal utility of processed pork at a bundle the consumer is considering buying is 3 and the marginal utility of avocados is 3. This bundle is on the budget line.
   1. Explain why the bundle the consumer is considering buying is not the optimal bundle.
   2. Is the optimal bundle going to be composed of more processed pork and fewer avocados or less processed pork and more avocados than the bundle under consideration? Illustrate using a graph and explain your reasoning below the graph.
3. If p1= 10, p2=20, and Y=200
   1. Draw the budget constraint.
   2. 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) from the price consumption curve using the example of p1=10 all else constant, p1=20 all else constant, and p1=5 all else constant.
   3. Show how to derive the individual’s demand curve from the graph in (b).
4. Circle whether the statement is true of false:
   1. A change in the price of a complement causes a shift in the supply curve all else held equal.

TRUE FALSE

* 1. The Marginal Rate of Substitution (MRS)= .

TRUE FALSE

* 1. A good is a normal good when *.*

TRUE FALSE

* 1. When the consumer views the two commodities as perfect substitutes the indifference curves take the shape of a straight line with little to no curvature.

TRUE FALSE

* 1. The Marginal Rate of Transformation (MRT) decreases when a consumer’s income increases.

TRUE FALSE

* 1. An indifference curve is composed of commodity bundles that give a consumer an equal level of utility.

TRUE FALSE

1. A food stamp policy is put in place in a state. For our representative consumer impacted by this policy, their initial income of Y =$1,000 is supplemented by a cash value of food stamps of $300. The initial budget constraint is , where f is units of food, o is units of all other good, and .
   1. Draw the original budget line and the budget line after the food stamp policy is implemented.
   2. Illustrate on another graph the indifference curves for **a consumer for whom it does not matter whether she is given $300 in cash or $300 worth of food stamps** in terms of the optimal bundle she will consume after being given the food stamps.



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1. Compared to this time last year, the price per can of hard / spiked seltzer has gone down by 14%.

* The American Beverage Association (ABA) argues that the price decline reflects an innovation in can manufacturing discovered in May 2021 that uses a less expensive metal to make the cans than was the case last year.
* The American Dental Association (ADA) points to their recent report that was covered by the Wall Street Journal. The study found that daily consumption of hard / spiked seltzer is the reason for the recent increase in adult tooth decay due to the large amount of sugar these drinks contain.

1. Graph ABA’s argument on a supply and demand graph for hard / spiked seltzer.
2. Graph ADA’s argument on a supply and demand graph for hard / spiked seltzer.
3. If the quantity of cans purchased decreased by 7% from last year to this year, which explanation is more consistent with the facts? Justify your answer.
4. What is the implied elasticity and what kind of elasticity is it?
5. Say that you know that the inverse demand curve for leaf blowers is: p=400 – (1/2)\*Qd (where p is the price per leaf blower and Qd is the quantity of leaf blowers demanded), and the (inverse) supply curve can be expressed in a similar fashion by p=(1/2)\*Qs -40.
   1. What is the equilibrium price quantity pair if the market for leaf blowers is perfectly competitive?

* 1. Leaf blowers are a major source of noise pollution which has led for calls to tax them to internalize the noise externality. If a specific tax of $20.00 is put on producers of leaf blowers to reduce this problem, what will be the new equilibrium quantity, price consumers pay, price sellers get, and tax revenue?
  2. What is the incidence of tax on consumers in this case?
  3. Illustrate your answers to a and b on a supply and demand graph and label all points and areas of interest.

Work Page