

Pledge: *No Aid; No Violations*

Please Sign the Pledge _____

Quiz #2

Note:

- Please answer in the space provided, or if you need more space continue on the back of the page or on the blank sheet at the end of the exam.
- Show your calculations in order that you may receive partial credit even if you make a numerical error.
- The examination should end at 11:50.
- After you finish the exam, check over your work carefully.
- You may turn in your exam and leave the room when you have finished – but please depart quietly.

Part I:

1. In Never-Never Land the annual demand for petroleum products is

$$q = 500,000p^{-1/2}M^{2/3},$$

where p is the price of petroleum products and M is income.

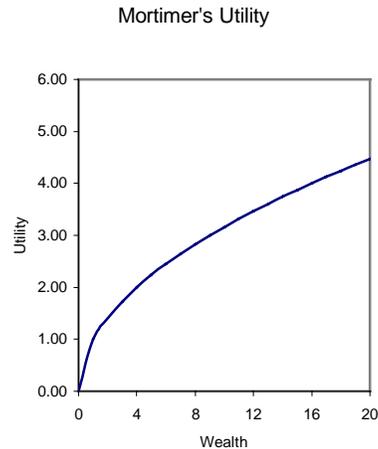
- a. What is the price elasticity of demand?
 - b. What is the income elasticity of demand?
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2. Based on a sample survey of 17,592 college students, economists Frank Chaloupka and Henry Wechsler concluded that a “10 percent increase in price would reduce cigarette consumption among smokers by 7 to 8%.” What does this imply about the price elasticity of demand for cigarettes by smokers?
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3. Your investment adviser reports that he has found a very promising investment for you. If you invest \$10,000 in the project he can almost guarantee you that you will get \$12,100 back at the end of two years. Is the annual internal rate of return for this promising project 5%, 10% or 21%? Explain.

Part II:

1. Mortimer has \$16 in his pocket. That is all he has; i.e., his wealth $W = \$16$. He is worried because he believes there is a 50% probability it will be stolen, in which case he will have nothing.

a. What is the expected value of his wealth?

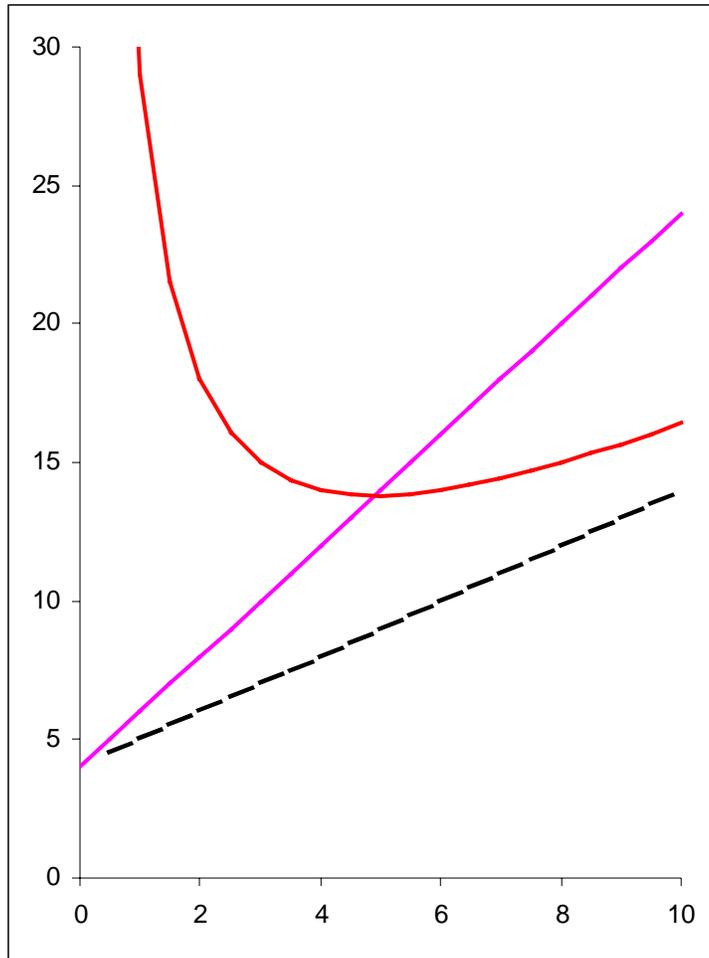
b. Mortimer's utility function is $U = W^{1/2}$. The utility function is plotted on the graph. What is Mortimer's expected utility.



- c. Is Mortimer a risk lover, risk adverse, or risk neutral? Explain.
- d. What is the maximum amount that Mortimer would be willing to pay in order to be insured against the risk of being robbed? Explain
- e. What is the “risk premium” for Mortimer of carrying the \$16 in his pocket?
2. Congratulations, you have inherited an oil well from your late Uncle Rich. It is estimated to hold 500,000 barrels of oil. And the current price of oil is \$20 per barrel. You could pump the oil out of the well and put the money in a Swiss bank account, where it would earn 10% interest. Or you could leave the oil in the ground and pump it next year or ever further in the future if you like.
- a. How much oil will you pump this year *if* you think the price of oil will rise by 12%? Explain why

- b. Suppose that oil well owners pump some but not all of their oil out of the ground this year – some oil is left in the ground for another year. Suppose also that all oil well owners have the same expectations about future price increases. What must be the expected rate of increase in the price of oil?
3. The production function for your company is $Q = L^{1/2} + K$.
- What is the marginal productivity of labor when $L = 4$?
 - What is the marginal productivity of capital when $K = 23$ and $L = 4$?
 - What is the marginal rate of substitution when $L = 4$ and $K = 23$?
 - Is this production function homothetic? Explain why or why not.
4. The BrandX firm has cost function $C(q) = 24 + 4q + q^2$.
- The average total cost, average variable cost and marginal cost curves are plotted on the graph. Please label these three curves on the graph. Also, label the axes appropriately.
 - If the firm's product were sold in a competitive market at price $p = \$20$, what quantity would the firm sell in order to maximize profits? Explain
5. The BrandY firm has the same cost function as the Brand X firm, shown on the graph. But the demand function facing the firm is $q = 10 - 1/3p$.
- What is the inverse demand function for this firm?
 - Plot the demand curve on the graph for this monopolist.
 - Derive the equation for marginal revenue. Plot the marginal revenue curve on the graph.

- d. Show on the graph what quantity the firm will sell in order to maximize profits. What price will it charge?



Honors Option:

At the meeting of your company's Board of Directors the President reports that the demand elasticity for their major project is $\eta = -\frac{1}{2}$. One of the Directors objects that the President should be fired because the firm cannot be maximizing profits. How did the Board Member know that profits were not being maximized?

Work space