ECON 100A FALL 2006
University of California, Berkeley
Practice Questions for Midterm 2

Problem 1: Multiple choice questions:

1. A decision maker has a utility function $U = I^2 + 500$. This decision maker is

   a) risk-averse.
   b) risk-neutral.
   c) risk-loving.
   d) risk-gaining.

2. A decision maker has a utility function $U = I - 100$. This decision maker is

   a) risk-averse.
   b) risk-neutral.
   c) risk-loving.
   d) risk-gaining.

3. A decision maker has a utility function $U = \sqrt{I}$. This decision maker is

   a) risk-averse.
   b) risk-neutral.
   c) risk-loving.
   d) risk-gaining.

4. A decision-maker is faced with a choice between a lottery with a 30% chance of a payoff of \$30 and a 70% chance of a payoff of \$80, and a guaranteed payoff of \$65. If the decision maker's utility function is $U = \sqrt{I}$, what is the risk-premium associated with this choice?

   a) \$1.59
   b) \$2.52
   c) \$0
   d) \$4

5. A decision-maker is faced with a choice between a lottery with a 30% chance of a payoff of \$30 and a 70% chance of a payoff of \$80, and a guaranteed payoff of \$65. If the decision maker's utility function is $U = I + 500$, what is the risk premium associated with this choice?

   a) \$0
   b) \$1
   c) \$2

d) $3

6. An investment opportunity is a sure thing; it will pay off $100 regardless of which of the three possible outcomes comes to pass. The variance of this investment opportunity:

a. is 0.
b. is 1.
c. is 2.
d. is -1.
e. cannot be determined without knowing the probabilities of each of the outcomes.

7. An investment opportunity has two possible outcomes. The expected value of the investment opportunity is $250. One outcome yields a $100 payoff and has a probability of 0.25. What is the payoff of the other outcome?

a. -$400
b. $0
c. $150
d. $300
e. none of the above

8. John Brown's utility of income function is U = log(I+1), where I represents income. From this information you can say that

a. John Brown is risk neutral.
b. John Brown is risk loving.
c. John Brown is risk averse.
d. we need more information before we can determine John Brown's preference for risk.

9. Amos Long's marginal utility of income function is given as: MU(I) = I1.5, where I represents income. From this you would say that he is

a. risk averse.
b. risk loving.
c. risk neutral.
d. none of these.

10. Any risk-averse individual would always

a. take a 10% chance at $100 rather than a sure $10.
b. take a 50% chance at $4 and a 50% chance at $1 rather than a sure $1.
c. take a sure $10 rather than a 10% chance at $100.
d. take a sure $1 rather than a 50% chance at $4 and a 50% chance at losing $1.
e. do (c) or (d) above.

11. Dante has two possible routes to travel on a business trip. One is more direct but more exhausting, taking one day but with a probability of business success of 1/4. The second takes three days, but has a probability of success of 2/3. If the value of Dante's time is $1000/day, the value of the business success is $12,000, and Dante is risk neutral,

a. it doesn't matter which path he takes, because he doesn't consider risk.
b. he should take the 1-day trip, because he doesn't consider risk.
c. he should take the 1-day trip, because $11,000 is greater than $9,000.
d. he should take the 3-day trip, because it will increase his expected net revenue by $3,000.
e. he should take the 3-day trip, because it will increase his expected net revenue by $5,000.

12. The difference between the utility of expected income and expected utility from income is

a. zero because income generates utility.
b. positive because if utility from income is uncertain, it is worth less.
c. negative because if income is uncertain, it is worth less.
d. that expected utility from income is calculated by summing the utilities of possible incomes, weighted by their probability of occurring, and the utility of expected income is calculated by summing the possible incomes, weighted by their probability of occurring, and finding the utility of that figure.
e. that the utility of expected income is calculated by summing the utilities of possible incomes, weighted by their probability of occurring, and the expected utility of income is calculated by summing the possible incomes, weighted by their probability of occurring, and finding the utility of that figure.

13. Which of the following statements is incorrect?

a) A risk-averse decision maker will choose the alternative with the lowest variance among alternatives with identical expected utilities.
b) A risk-neutral decision maker will always choose the alternative with the lowest variance among alternatives with identical expected utilities.
c) A risk-loving decision maker will choose the alternative with the highest variance among alternatives with identical expected utilities.
d) The expected utility of a lottery is the expected value of the utility levels that the decision maker receives from the payoffs in the lottery.

14. Consider a lottery with four equally likely outcomes, A, B, C, and D. The associated payoffs are: A - $10, B - $30, C - $70, and D - $150. The variance of this lottery is

a) 2,875
b) 5,750
c) 8,625
d) 11,500

15. Consider a lottery with four possible outcomes, A, B, C, and D. The associated payoffs are: A - $10, B - $30, C - $70, and D - $150. The probabilities are $P(A) = 0.40$, $P(B) = 0.20$, $P(C) = 0.30$, and $P(D) = 0.10$. The expected value of this lottery is

a) $23
b) $46
c) $65
d) $260

16. Consider a lottery with four equally likely outcomes, A, B, C, and D. The associated payoffs are: A - $10, B - $30, C - $70, and D - $150. The expected value of this lottery is

a) $30
b) $65
c) $130
d) $260

17. Consider a lottery with four equally likely outcomes, A, B, C, and D. The associated payoffs are: A - $10, B - $30, C - $70, and D - $150. The variance of this lottery is

a) 2,875
b) 5,750
c) 8,625
d) 11,500

18. Ronald has $18,000. But he is forced to bet it on the flip of a fair coin. If he wins he has $36,000. If he loses he has nothing. Ronald's expected utility function is $.5x^{0.5} + .5y^{0.5}$, where x is his wealth if heads comes up and y is his wealth if tails comes up. Since he must make this bet, he is exactly as well off as if he had a perfectly safe income of

a. $16,000.
b. $15,000.
c. $12,000.
d. $11,000.
e. $9,000.

19. William has $80,000. But he is forced to bet it on the flip of a fair coin. If he wins he has $160,000. If he loses he has nothing. Ronald's expected utility function is $.5x^{1/4} + .5y^{1/4}$, where x is his wealth if heads comes up and y is his wealth if tails comes up. Since he must make this bet, he is exactly as well off as if he had a perfectly safe income of

a. $16,000.
b. $8,000.
c. $40,000.
d. $10,000.
e. $20,000.

20. Clancy has $1,800. He plans to bet on a boxing match between Sullivan and Flanagan. He finds that he can buy coupons for $9 that will pay off $10 each if Sullivan wins. He also finds in another store some coupons that will pay off $10 if Flanagan wins. The Flanagan tickets cost $1 each. Clancy believes that the two fighters each have a probability of 1/2 of winning. Clancy is a risk averter who tries to maximize the expected value of the natural log of his wealth. Which of the following strategies would maximize his expected utility?

a. Don't gamble at all.

b. Buy 100 Sullivan tickets and 900 Flanagan tickets.
c. Buy exactly as many Flanagan tickets as Sullivan tickets.
d. Buy 50 Sullivan tickets and 450 Flanagan tickets.
e. Buy 50 Sullivan tickets and 900 Flanagan tickets.

21. Clancy has $5,000. He plans to bet on a boxing match between Sullivan and Flanagan. He finds that he can buy coupons for $5 that will pay off $10 each if Sullivan wins. He also finds in another store some coupons that will pay off $10 if Flanagan wins. The Flanagan tickets cost $5 each. Clancy believes that the two fighters each have a probability of 1/2 of winning. Clancy is a risk averter who tries to maximize the expected value of the natural log of his wealth. Which of the following strategies would maximize his expected utility?
a. Buy exactly as many Flanagan tickets as Sullivan tickets.
b. Buy 250 Sullivan tickets and 250 Flanagan tickets.
c. Don't gamble at all.
d. Buy 500 Sullivan tickets and 500 Flanagan tickets.
e. Buy 250 Sullivan tickets and 500 Flanagan tickets.

22. Clancy has $1,800. He plans to bet on a boxing match between Sullivan and Flanagan. He finds that he can buy coupons for $9 each that will pay off $10 each if Sullivan wins. He also finds in another store some coupons that will pay off $10 if Flanagan wins. The Flanagan tickets cost $1 each. Clancy believes that the two fighters each have a probability of 1/2 of winning. Clancy is a risk averter who tries to maximize the expected value of the natural log of his wealth. Which of the following strategies would maximize his expected utility?
a. Don't gamble at all.
b. Buy 100 Sullivan tickets and 900 Flanagan tickets.
c. Buy exactly as many Flanagan tickets as Sullivan tickets.
d. Buy 50 Sullivan tickets and 450 Flanagan tickets.
e. Buy 50 Sullivan tickets and 900 Flanagan tickets.

23. Clancy has $1,800. He plans to bet on a boxing match between Sullivan and Flanagan. He finds that he can buy coupons for $1 each that will pay off $10 each if Sullivan wins. He also finds in another store some coupons that will pay off $10 if Flanagan wins. The Flanagan tickets cost $9 each. Clancy believes that the two fighters each have a probability of 1/2 of winning. Clancy is a risk averter who tries to maximize the expected value of the natural log of his wealth. Which of the following strategies would maximize his expected utility?
a. Don't gamble at all.
b. Buy 450 Sullivan tickets and 50 Flanagan tickets.
c. Buy exactly as many Flanagan tickets as Sullivan tickets.
d. Buy 900 Sullivan tickets and 100 Flanagan tickets.
e. Buy 450 Sullivan tickets and 100 Flanagan tickets.
Difficulty:
Correct Answer: c

24. Clancy has $4,800. He plans to bet on a boxing match between Sullivan and Flanagan. He finds that he can buy coupons for $4 each that will pay off $10 each if Sullivan wins. He also finds in another store some coupons that will pay off $10 if Flanagan wins. The Flanagan tickets cost $6 each. Clancy believes that the two fighters each have a probability of 1/2 of winning.

Clancy is a risk averter who tries to maximize the expected value of the natural log of his wealth. Which of the following strategies would maximize his expected utility?

a. Don't gamble at all.
b. Buy exactly as many Flanagan tickets as Sullivan tickets.
c. Buy 600 Sullivan tickets and 400 Flanagan tickets.
d. Buy 300 Sullivan tickets and 200 Flanagan tickets.
e. Buy 300 Sullivan tickets and 400 Flanagan tickets.

25. Clancy has $4,200. He plans to bet on a boxing match between Sullivan and Flanagan. He finds that he can buy coupons for $7 each that will pay off $10 each if Sullivan wins. He also finds in another store some coupons that will pay off $10 if Flanagan wins. The Flanagan tickets cost $3 each. Clancy believes that the two fighters each have a probability of 1/2 of winning. Clancy is a risk averter who tries to maximize the expected value of the natural log of his wealth. Which of the following strategies would maximize his expected utility?

a. Don't gamble at all.
b. Buy 150 Sullivan tickets and 350 Flanagan tickets.
c. Buy 300 Sullivan tickets and 700 Flanagan tickets.
d. Buy exactly as many Flanagan tickets as Sullivan tickets.
e. Buy 150 Sullivan tickets and 700 Flanagan tickets.

26. Tom Cruiser's car is worth $100,000. But Tom is careless and leaves the top down and the keys in the ignition. Consequently his car will be stolen with probability .5. If it is stolen, he will never get it back. Tom has $100,000 in other wealth and his von Neumann-Morgenstern utility function for wealth is $u(w) = \ln(w)$. Suppose that Tom can buy $K worth of insurance at a price of $.6K. How much insurance will Tom buy?

a. $0
b. $100,000
c. More than $0 but less than $50,000
d. More than $50,000 but less than $100,000
e. Exactly $50,000

27. The number of "NO to MATH" buttons demanded on a certain university campus is given by $D(p) = 100 - p$, where p is the price of buttons measured in pennies. The supply function is $S(p) = p$. The current administration manages to enforce a price ceiling of .40¢ per button. The effect on net consumer's surplus is

a. an increase of $5.50.
b. an increase of $3.50.
c. no change.
d. a decrease of $3.50.
e. a decrease of $5.50.

28. Herbie's utility function is $U(x, y) = x + 8y - y^2/2$, where x is the number of x's he consumes per week and y is the number of y's he consumes per week. Herbie has $200 a week to spend. The price of x is $1. The price of y is currently $4 per unit. Herbie has received an invitation to join a club devoted to the consumption of y. If he joins the club, Herbie can get a discount on the purchase of y. If he belonged to the club, he could buy y for $1 a unit. How much is the most Herbie would be willing to pay to join this club?

a. $33
b. $21
c. $4.50
d. $16.50
e. None of the above.

29. Pablo's utility function is $U(x, y) = x + 10y - y^2/2$, where x is the number of x's he consumes per week and y is the number of y's he consumes per week. Pablo has $200 a week to spend. The price of x is $1. The price of y is currently $5 per unit. Pablo has received an invitation to join a club devoted to the consumption of y. If he joins the club, Pablo can get a discount on the purchase of y. If he belonged to the club, he could buy y for $1 a unit. How much is the most Pablo would be willing to pay to join this club?

a. $8
b. $28
c. $36
d. $56
e. None of the above.

30. Lolita, the Holstein cow, has a utility function is $U(x, y) = x - x^2/2 + y$, where x is her consumption of cow feed and y is her consumption of hay. If the price of cow feed is $.30, the price of hay is $1, and her income is $4, and if Lolita chooses the combination of hay and cow feed that she likes best from among those combinations she can afford, her utility will be

a. 4.25.
b. 3.70.
c. 0.25.
d. 6.25.
e. 2.25.

31. Lolita, the Holstein cow, has a utility function is $U(x, y) = x - x^2/2 + y$, where x is her consumption of cow feed and y is her consumption of hay. If the price of cow feed is $.10, the price of hay is $1, and her income is $2, and if Lolita chooses the combination of hay and cow feed that she likes best from among those combinations she can afford, her utility will be

a. 1.90.
b. 3.40.
c. 2.40.
d. 0.40.
e. 1.40.

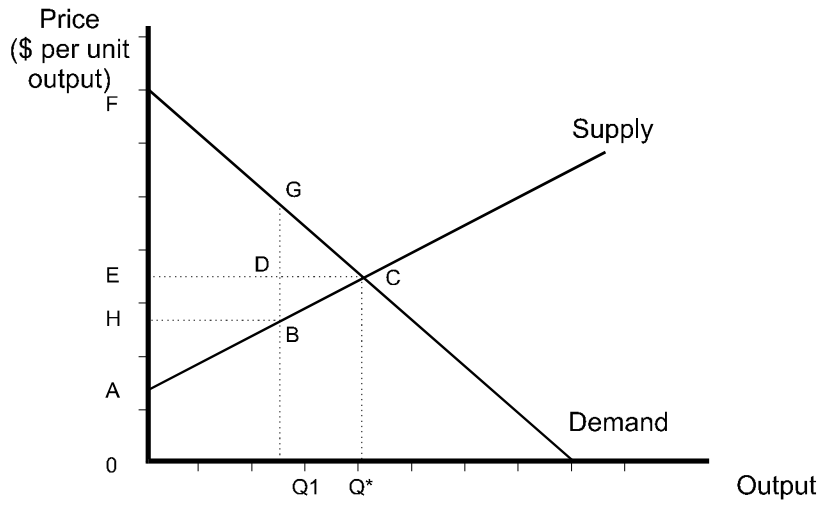


Figure 1

32. Refer to Figure 1. At price 0E and quantity Q*, consumer surplus is the area
    a. 0FCQ*.
    b. AFC.
    c. EFC.
    d. AEC.
    e. none of the above.

33. Refer to Figure 1. At price 0E and quantity Q*, producer surplus is the area
    a. 0ACQ*.
    b. 0ECQ*.
    c. 0FCQ*.
    d. EFC.
    e. none of the above.

34. Refer to Figure 1. At price 0E and quantity Q*, the deadweight loss is
    a. 0ACQ*.
    b. 0ECQ*.
    c. 0FCQ*.
    d. EFC.
    e. none of the above.

35. Refer to Figure 1. At price 0H and quantity Q1, consumer surplus is the area
    a. EDGF.
    b. 0FGQ1.
    c. HFGB.
    d. EFC.
    e. none of the above.

36. Refer to Figure 1. At price 0H and quantity Q1, producer surplus is the area

a. 0ABQ1.
b. 0EDQ1.
c. AHB.
d. 0FGQ1.
e. none of the above.

37. Refer to Figure 1. At price 0H and quantity Q1, the deadweight loss is
a. DGC.
b. BDC.
c. BGC.
d. 0FGQ1.
e. none of the above.

38. Two firms, Wickedly Efficient Widgets (WEW) and Wildy Nepotistic Widgets (WNW) both produce widgets, using the same production function $y = K^{1/2}L^{1/2}$, where K is the amount of labor used and L is the amount of capital used. Each company can hire labor at \$1 per unit of labor and capital at \$9 per unit. Each company produces 90 widgets per week. WEW chooses its input combinations to produce in the cheapest way possible. Although it produces the same output per week as WEW, WNW is required by its dotty CEO to use twice as much labor as WEW. How much higher are WNW's total costs per week than WEW's?
a. \$270
b. \$67.50
c. \$275
d. \$135
e. \$132

39. A firm has the production function $Q = X^{1/2}{}_1X_2$. In the short run it must use exactly 35 units of factor 2. The price of factor 1 is \$105 per unit and the price of factor 2 is \$3 per unit. The firm's short-run marginal cost function is
a. $MC(Q) = 105Q^{-1/2}$.
b. $MC(Q) = 6Q/35$.
c. $MC(Q) = 105 + 105Q^2$.
d. $MC(Q) = 3Q$.
e. $MC(Q) = 35Q^{-1/2}$.

40. The inverse demand function for cantaloupes is defined by the equation $p = 305 - 5q$, where q is the number of units sold. The inverse supply function is defined by $p = 8 + 4q$. A tax of \$45 is imposed on suppliers for each unit of cantaloupes that they sell. When the tax is imposed, the quantity of cantaloupes sold falls to
a. 28.
b. 33.
c. 21.75.
d. 26.
e. 30.50.

41. An industry has 1,000 firms, each with the production function $f(x_1, x_2) = x^{1/2}{}_1x^{1/2}{}_2$. The price of factor 1 is \$1 and the price of factor 2 is \$1. In the long run, both factors are variable, but in the short run, each firm is stuck with using 100 units of factor 2. The long-run industry supply curve is

a. upward sloping with zero supply if price is less than $10.
b. downward sloping for outputs less than 10.
c. horizontal with zero supply for prices less than $2 and infinite supply for prices greater than $2.
d. horizontal with zero supply for prices less than $10 and infinite supply for prices greater than $10.
e. upward sloping with zero supply if price is less than $20.

42. The textbook for your class was not produced in a perfectly competitive industry because
a. there are so few firms in the industry that market shares are not small, and firms' decisions have an impact on market price.
b. upper-division microeconomics texts are not all alike.
c. it is not costless to enter or exit the textbook industry.
d. of all of the above reasons.

43. Owners and managers
a. must be the same people.
b. may be different people with different goals, and in the long run firms that do best are those in which the managers are allowed to pursue their own independent goals.
c. may be different people with different goals, but in the long run firms that do best are those in which the managers pursue the goals of the owners.
d. may be different people with different but exactly complementary goals.
e. may be different people with the same goals.

44. If a graph of a perfectly competitive firm shows that the MR=MC point occurs where MR is above AVC but below ATC,
a. the firm is earning negative profit, and will shut down rather than produce that level of output.
b. the firm is earning negative profit, but will continue to produce where MR=MC in the short run.
c. the firm is still earning positive profit, as long as variable costs are covered.
d. the firm is covering explicit, but not implicit, costs.
e. the firm can cover all of fixed costs but only a portion of variable costs.

45. Bette's Breakfast, a perfectly competitive eatery, sells its "Breakfast Special" (the only item on the menu) for $5.00. The costs of waiters, cooks, power, food etc. average out to $3.95 per meal; the costs of the lease, insurance and other such expenses average out to $1.25 per meal. Bette should
a. close her doors immediately.
b. continue producing in the short and long run.
c. continue producing in the short run, but plan to go out of business in the long run.
d. raise her prices above the perfectly competitive level.
e. lower her output.

46. If price is between AVC and ATC, the best and most practical thing for a perfectly competitive firm to do is

a. raise prices.
b. lower prices to gain revenue from extra volume.
c. shut down immediately, but not liquidate the business.
d. shut down immediately and liquidate the business.
e. continue operating, but plan to go out of business.

47. A firm never operates
a. at the minimum of its ATC curve.
b. at the minimum of its AVC curve.
c. on the downward-sloping portion of its ATC curve.
d. on the downward-sloping portion of its AVC curve.
e. on its long-run marginal cost curve.

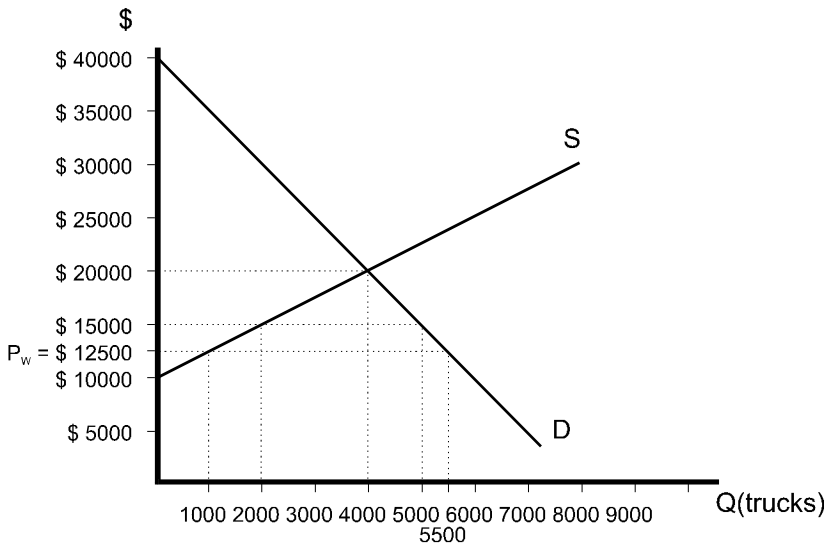
48. When the price faced by a competitive firm was $5, the firm produced nothing in the short run. However, when the price rose to $10, the firm produced 100 tons of output. From this we can infer that
a. the firm's marginal cost curve must be flat.
b. the firm's marginal costs of production never fall below $5.
c. the firm's average cost of production was less than $10.
d. the firm's total cost of producing 100 tons is less than $1000.
e. the minimum value of the firm's average variable cost lies between $5 and $10.

49. Which of the following policies could lead to a deadweight loss?
a. price ceilings.
b. price floors.
c. policies prohibiting human cloning.
d. all of the above.
e. (a) and (b) only.

50. When the federal government installs a price support program that requires the government to purchase all of a good not bought in the private economy at the support price, changes in producer surplus
a. are negative.
b. are positive, but more than offset by the cost to consumers and the government.
c. are positive, and not offset by the cost to consumers and the government.
d. and consumer surplus are both positive.

51. Compared to a tariff, an import quota, which restricts imports to the same amount as the tariff, will leave the country as a whole
a. worse off than a comparable tariff.
b. not as bad off as a comparable tariff.
c. about the same as a comparable tariff.
d. any of the above can be true.

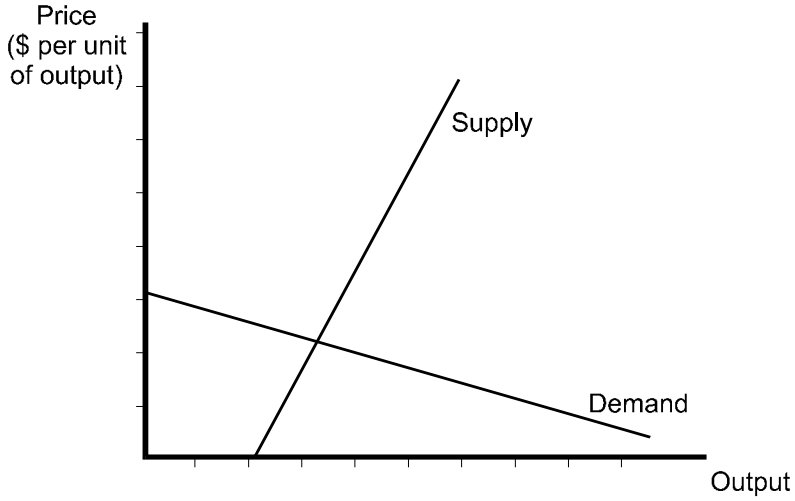
52.



World price is $12,500. Suppose an import quota of 3000 trucks is imposed. The quota will make total consumer surplus equal to

a. $25,000.
b. $13,125,000.
c. $40,000,000.
d. $62,500,000.
e. $75,625,000.

53. A specific tax will be imposed on a good. The supply and demand curves for the good are shown in the diagram below. Given this information, the burden of the tax:



a. is shared about evenly between consumers and producers.
b. falls mostly on consumers.
c. falls mostly on producers.
d. cannot be determined without more information on the price elasticities of supply and demand.

54. The burden of a tax per unit of output will fall heavily on consumers when demand is relatively _____ and supply is relatively _____.

a. inelastic; elastic
b. inelastic; inelastic
c. elastic; elastic
d. elastic; inelastic

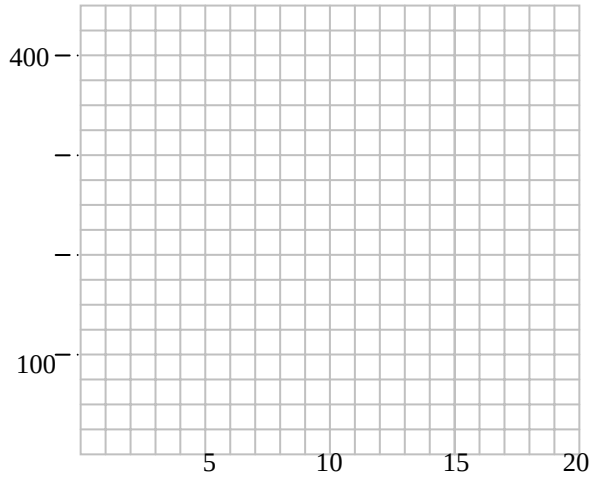
55. When the government imposes a specific tax per unit on a product, changes in consumer surplus are _____ and changes in producer surplus are _____.

a. negative; positive
b. positive; positive
c. negative; negative
d. positive; negative

Problem 2 Yvonne is an innate gambler who has a utility function of her total wealth: $U(w)=w^2$. Right after getting her paycheck for 9 dollars she heads towards the Casino to participate in the following lottery: there is a .20 probability of winning $11 and a .80 probability of loosing $4 dollars.

a) What is the expected value of this lottery?

b) Plot Yvonne's utility function and label the utility levels from each scenario (winning and not winning), and the expected utility level.



c) Right when the gamble was about to start, Yvonne's friend came to convince her not to play. How much did Yvonne's friend had to give in order to take her away from the Casino? Keep in mind that Yvonne started with 9 dollars. Write your answer below and show it in the above figure.

<u>Problem 3</u> Petra Cotes breeds parrots for a living. She has discovered that the production function for parrot chicks (Q) is:

$Q = K^{1/2}L1^{1/2}$

where K is capital (for example nest boxes, cages and the like) and L is parrot food. The marginal products of capital and labor are as follows:

$MPK = .5K^{-1/2}L^{1/2}$ $MPL = .5K^{1/2}L^{-1/2}$

The price of K is $8 and the price of L is $2.

a. What type of production function is this?
b. Does this production function exhibit constant, increasing or decreasing returns to scale? Explain.
c. What is the average product of capital?
d. Does capital obey the "law of diminishing returns?" Explain.
e. Suppose that Duane wants 144 parrot chicks, how much K and L should be employed to minimize costs, and what is the cost of producing 144 parrot chicks?
f. Suppose that Duane is faced with the same problem as in (f) except that he has a fixed amount of K. In fact, K = 16. How much L should be employed to minimize costs, and what is the total cost?

Consider the following Study Guide problems:

Ch. 5, # 3, 4 (p. 95 - 96)

Ch. 6, # 8, 9 (p. 115)

Ch. 7, # 17, 18, 19 (p. 136)

Ch. 8, # 12, 13, 14 (p. 157)

Ch, 9, # 5 (p. 175), 9, 10, 11, 13 (177 - 179)

Notice that # 8 (p. 177) is similar to Problem 3 of Homework 4.

The Study Guide is available in Moffitt library – I placed it on reserve.