

## Midterm 2

### Multiple Choice (4 points each)

- 1) If Fred's marginal rate of substitution of salad for pizza equals -3, then
  - A) his marginal utility from last pizza is three times of his marginal utility from last salad.
  - B) he would give up three pizzas to get the next salad.
  - C) he will eat three times as much pizza as salad.
  - D) he will eat three times as much salad as pizza.
- 2) The marginal rate of transformation of y for x equals
  - A) the slope of the budget constraint (when y is on the vertical axis).
  - B) the rate at which the consumer must give up y to get one more x.
  - C)  $-P_x/P_y$ .
  - D) All of the above.
- 3) If the price of X increases and the price of Y and income stay fixed, what will happen to the budget line?
  - A) The budget line rotates inward from the intercept on the Y-axis.
  - B) The budget line rotates outward from the intercept on the Y-axis.
  - C) The budget line shifts inward without a change in slope.
  - D) Nothing.

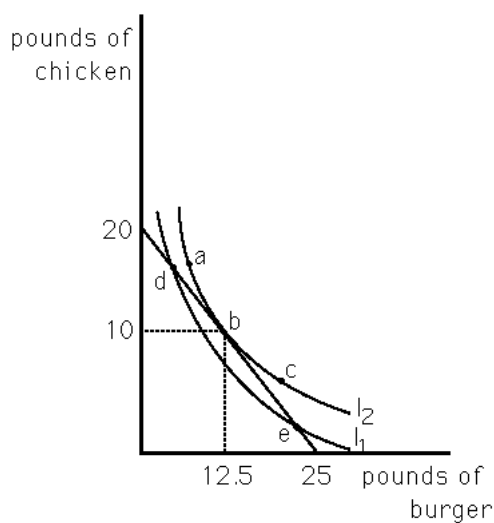
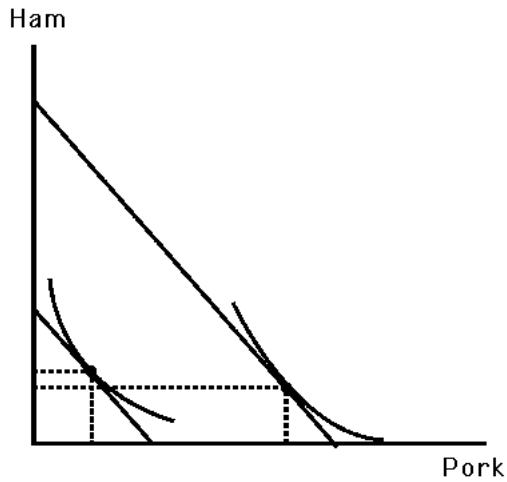


Figure 1

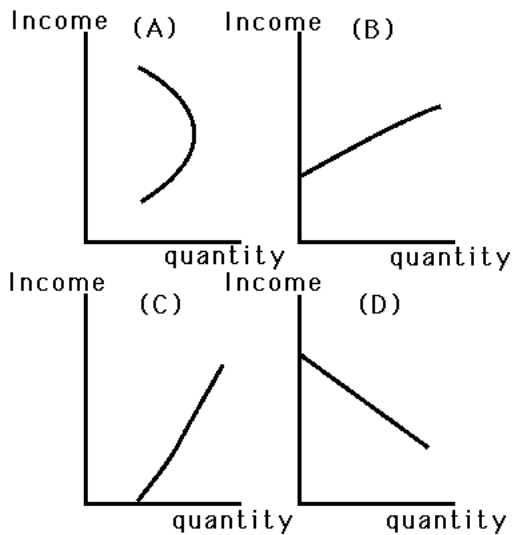
- 4) Max has allocated \$100 toward meats for his barbecue. His budget line and an indifference map are shown in Figure 1. Which bundle will Max choose?

- A) a
- B) b
- C) c
- D) d



**Figure 2**

- 5) Figure 2 shows Larry's indifference map and budget lines for ham and pork. Which of the following statements is TRUE?
- A) Both ham and pork are inferior goods.
  - B) Ham is a normal good and pork is an inferior good.
  - C) Neither pork nor ham is an inferior good.
  - D) Pork is a normal good and ham is an inferior good.



**Figure 3**

- 6) When John's income was low, he could not afford to dine out and would respond to a pay raise by purchasing more frozen dinners. Now that his income is high, a pay raise causes him

to dine out more often and buy more frozen dinners. Which graph in Figure 3 best represents John's Engel curve for frozen dinners?

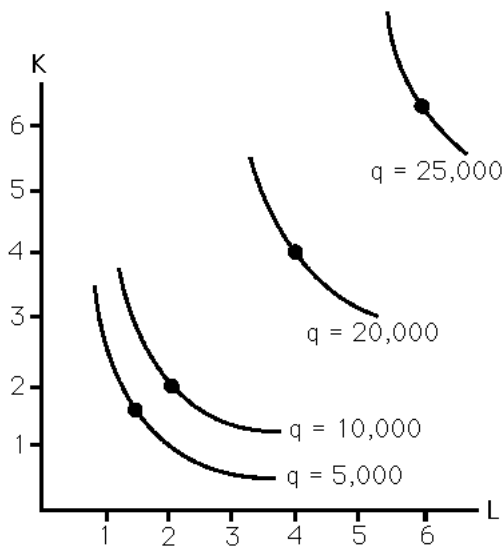
- A) Graph A
- B) Graph B
- C) Graph C
- D) Graph D

- 7) In response to an increase in the wage rate, the substitution effect will cause a person to
- A) supply the same hours of labor.
  - B) supply fewer hours of labor.
  - C) supply more hours of labor.
  - D) have a backward bend in her labor supply curve.

Labor	Output
1	10
2	18
3	24
4	28
5	30

**Figure 4**

- 8) Figure 4 shows the short-run production function for Albert's Pretzels. The law of diminishing marginal productivity
- A) first appears with the second worker.
  - B) first appears with the fourth worker.
  - C) first appears with the fifth worker.
  - D) has not yet appeared for any of the levels of labor.
- 9) The flatter an isoquant is (K is on the vertical axis)
- A) the greater is the substitutability between capital and labor.
  - B) the greater is the marginal productivity of labor relative to that of capital.
  - C) the greater is the marginal productivity of capital relative to that of labor.
  - D) the greater is the level of output.



**Figure 5**

10) Figure 5 shows the isoquants for producing steel. Decreasing returns to scale are

- A) present between producing 5,000 to 10,000 tons.
- B) present between producing 10,000 to 20,000 tons.
- C) present between producing 20,000 to 25,000 tons.
- D) never present.

**Essays and Calculations**

11) Lisa consumes only pizzas and burritos. Her optimal choice is 3 pizzas and 5 burritos per week. At her optimal bundle, her marginal utility of pizza is 20 and her marginal utility of burrito is 10. The price of a pizza is \$4.

- i. Describe the condition for Lisa's optimal choice in English and also using  $P_B$ ,  $P_Z$ ,  $MU_B$ , and  $MU_Z$  (this is apparently an interior solution). (5 points)
- ii. Can you determine the price of a burrito? (5 points)

12) Ms. Tess Taker has a weekly income of \$42, which she allocates between movies, at \$6 per movie, and boxes of six-packed soda, at \$6 per box. Below is her total utility (TU) schedule for each good.

Movie (\$6 per each)		Soda (\$6 per box)	
Quantity	TU	Quantity	TU
0	0	0	0
1	62	1	75
2	114	2	117
3	156	3	149
4	188	4	179
5	210	5	206

- i. Suppose Ms. Taker chooses 5 movies and 2 boxes of soda. What is the marginal utility of the last dollar spent on each good. (5 points)
- ii. Explain why this is not the combination which maximizes Ms. Taker's total utility subject to her budget constraint. Should she consume more movies or soda, why? (5 points)
- iii. Which combination of movies and soda gives her the maximal total utility? Explain why this is her optimal choice in terms of your answer to question 11.i. (5 points)

- 13) When the price of good X decreases, a consumer's buying behavior changes. There are two components: the substitution effect and the income effect.
- i. Is the substitution effect positive or negative in this case? Why is it positive or negative? (5 points)
  - ii. The Engel curve describes the relationship between two variables. Which two (price, quantity demanded, quantity supplied, income, cost, profit, ...)? The consumer's Engel curve for good X is downward sloping. Is X a normal good or inferior good? (5 points)
  - iii. Explain, using the substitution and income effects, when is the total effect positive and when is it negative? (5 points)
  - iv. Use a graph (good X on the horizontal axis and Y on the vertical) to illustrate the case when the total effect is positive. Hint: Draw the budget constraint  $BC_1$  with the old price. Draw an indifference curve and mark the optimal choice  $e_1$ . Draw the new budget constraint  $BC_2$  with the lower price of X. Draw an indifference curve and mark the new choice  $e_2$ . Find the reference point  $e^*$  and show with arrows the substitution, income, and total effects on the horizontal axis. (5 points)

- 14) Alex and Allison both receive a wage rate  $w_1$  for each working hour. We know that leisure is a normal good to both of them. Now their boss increases their wage to  $w_2$ . After hearing this raise, Alex decides to work more and Allison decides to work less.
- i. Can you explain the difference in their decision using the substitution and income effects (on leisure)? (5 points)
  - ii. Draw a graph (goods on the vertical axis and leisure on the horizontal) to illustrate Allison's decision. Hint: Draw the budget constraint  $BC_1$  with wage rate  $w_1$ . Draw an indifference curve and mark the optimal choice  $e_1$ . Draw the new budget constraint  $BC_2$  with the new wage rate  $w_2$ . Draw an indifference curve and mark the new choice  $e_2$ . Find the reference point  $e^*$  and label with arrows the income, substitution, and total effects on the horizontal axis. (5 points)
  - iii. Explain how you choose the reference point  $e^*$ . Hint: Is Allison facing the old or the new wage, enjoying the old or the new utility level? (5 points)