

ECON 100A FALL 2006
University of California, Berkeley
Answers to Practice Questions for Midterm 1

Problem 1: Please, solve Review Question #3, on p. 141 of the textbook.

Explain whether the following statements are true or false.

a) The marginal rate of substitution diminishes as an individual moves downward along the demand curve.

Answer (a): True. The consumer maximizes his utility by choosing the bundle on his budget line where the price ratio is equal to the MRS. Suppose the consumer chooses the quantity of goods 1 and 2 such that

$$\frac{P_1}{P_2} = MRS.$$

As the price of good 1 falls, the price ratio decreases, and hence the MRS becomes smaller. This means that when the price of good 1 falls, the consumer is willing to give up fewer units of good 2 in exchange for an extra unit of good 1.

b) The level of utility increases as an individual moves downward along the demand curve.

Answer (b): True. As the price of a good falls, the budget line pivots outwards and the consumer is able to move to a higher indifference curve.

c) Engel curves always slope upwards.

Answer (c): False. The Engel curve identifies the relationship between the quantity demanded of a good and income, all else the same. If the good is inferior, then as income increases, quantity demanded will decrease, and the Engel curve will slope downwards.

Problem 2: [Please, solve Problem #7, on p. 143 of the textbook.]

The director of a theatre company in a small college town is considering changing the way he prices tickets. He has hired an economic consulting firm to estimate the demand for tickets. The firm has classified people who go the theatre into two groups, and has come up with two demand functions. The demand curves for the general public (Q_{gp}) and students (Q_s) are given below.

$$Q_{gp} = 500 - 5P$$

$$Q_s = 200 - 4P$$

a) Graph the two demand curves on one graph, with P on the vertical axis and Q on the horizontal axis. If the current price of tickets is \$35, identify the quantity demanded by each group.

Answer (a): Both demand curves are downward sloping and linear. For the general public, the vertical intercept is 100 and the horizontal intercept is 500. For the students, the vertical intercept is 50 and the horizontal intercept is 200.

For general public:

$$Q_{gp} = 500 - 5(35) = 325$$

And for the students:

$$Q_s = 200 - 4(35) = 60$$

b) Find the price elasticity of demand for each group at the current price and quantity.

Answer (b)

$$\varepsilon_{gp} = \frac{dQ/Q}{dP/P} = dQ_{gp}/dP \frac{P}{Q_{gp}} = \frac{-5(35)}{325} = -0.54$$

And

$$\varepsilon_s = \frac{dQ/Q}{dP/P} = dQ_s/dP \frac{P}{Q_s} = \frac{-4(35)}{60} = -2.33$$

The elasticity for the general public is

$$\varepsilon_{gp} = \frac{-5(35)}{325} = -0.54$$

and the elasticity for the students is

$$\varepsilon_s = \frac{-4(35)}{60} = -2.33$$

If the price of tickets increases by one percent then the general public will demand .54% fewer tickets and the students will demand 2.33% fewer tickets.

c) Is the director maximizing the revenue he collects from ticket sales by charging \$35 for each ticket? Explain.

Answer (c): No he is not maximizing revenue. Revenues are maximized when elasticity is – 1, and neither one of the calculated elasticities is equal to –1. Since demand by the general public is inelastic (the absolute value of elasticity is lower than 1) at the current price, the director could increase the price, and increase his revenues.

Since demand by the students is elastic (the absolute value of elasticity is exceeds 1) at the current price, the director could decrease the price, and increase his revenues.

d) What prices should he charge if he maximizes revenue collected from ticket sales?

Answer (d): To figure this out, set elasticities to –1, and solve for prices and quantities.

For the general public

$$\varepsilon_{gp} = \frac{-5P}{Q} = -1$$

$$5P = Q = 500 - 5P$$

$$P = 50, Q = 250.$$

For the students:

$$\varepsilon_s = \frac{-4P}{Q} = -1$$

$$4P = Q = 200 - 4P$$

$$P = 25, Q = 100.$$

Problem 3:

Suppose that the only two goods you consume are wine and roses. On Tuesday the price of wine goes up, and at the time your income increases by just enough so that you are equally as happy as you were on Monday.

- (a) What happens to the quantity of wine that you will consume? Illustrate this with indifference curves.

Wine consumption falls.

- (b) On Tuesday would you still be able to afford the same basket that you were buying on Monday? How do you know?

No. Compare the two budget lines.

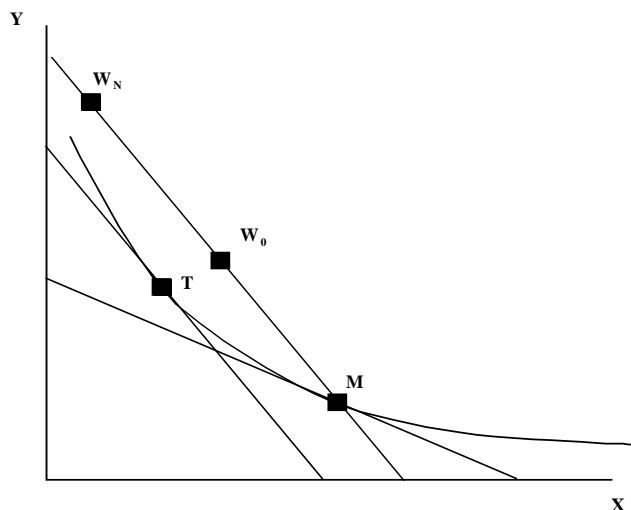
On Wednesday there are no new price changes (so the Tuesday prices are still in effect), but your income changes to the point where you can just exactly afford Monday's basket.

- (c) Are you happier on Wednesday or Monday? **Wednesday.**
 (d) Is it possible to say with certainty whether you buy more wine on Wednesday than on Monday? If not, on what would your answer depend?

You will buy more wine on Monday.

- (e) Is it possible to say with certainty whether you buy more wine on Wednesday than on Tuesday? If not, on what would your answer depend?

It is uncertain. If wine is a normal good, then you will end up at a point such as W_0 . But if wine is an inferior good, then you will end up at a point like W_N . [Note – we have not defined the concept of inferior good yet, so you were not required to mention this.]



Problem 4 Briefly explain in a sentence or two how you could tell

- whether a good is a normal good or an inferior good.
- whether a good is a luxury or a necessity.
- whether two goods are complements or substitutes.

Answer:

- If prices are left constant and income rises, demand for a normal good will rise and demand for an inferior good will fall.**
- If income rises, expenditure on it will rise more or less than proportionately depending on whether the good is a luxury or necessity respectively.**
- Two goods are complements or substitutes depending on whether a rise in the price of one of them increases or decreases demand for the other.**

Problem 5 Multiple Choice: Correct answers are marked **bold**

- If indifference curves are upward sloping, this violates the assumption that preferences:
 - are complete
 - are transitive.
 - require that more is better.**
 - Upward sloping indifference curves do not violate any of the assumptions about preferences.
- Suppose $MRS_{XY} = 3$:
 - The consumer is willing to substitute 3 units of X for 1 unit of Y to leave utility unchanged.
 - The consumer is willing to substitute 3 units of Y for 1 unit of X to leave utility unchanged (such goods are perfect substitutes)**
 - Regardless of prices, the consumer will consume only Y.
 - Regardless of prices, the consumer will consume only X.
- Which of the following statements is false?:

- (a) **Consumer preferences show how a consumer would rank any two baskets, given their relative prices.**
- (b) Consumer preferences show how a consumer would rank any two baskets, assuming the baskets were available at no cost to the consumer.
- (c) A consumer's individual tastes will determine how much satisfaction she derives from the consumption of various combinations of goods and services.
- (d) Consumer preferences are but one part of the consumer's ultimate purchasing decision.
- (4) At any point on an indifference curve, the slope indicates
- (a) the relative price ratio of the two goods.
- (b) the way the consumer's budget is allocated between the two goods.
- (c) **the marginal rate of substitution between the two goods.**
- (d) how the total satisfaction of the consumer changes with different market baskets.
- (5) Identify the truthfulness of the following statements.
- I. Diminishing marginal utility and increasing total utility are incompatible with each other.
- II. When marginal utility is negative, total utility is decreasing.
- (a) Both I and II are true.
- (b) Both I and II are false.
- (c) I is true; II is false.
- (d) I is false; II is true.
- (6) A wheel of cheddar cheese costs Carl \$40 and a night at a Broadway show costs him \$100 (including the ticket, parking, etc.). When Carl maximizes his utility, his marginal utility from cheddar cheese is 8 utils, and his marginal utility from a Broadway show is therefore:
- (a) 3.2
- (b) **20**
- (c) 50
- (d) 500
- (e) None of the above.

b) At the utility maximizing point $MU_C / MU_B = P_C / P_B$, where C = cheese and B = Broadway show. Therefore, $8/MU_B = 40/100$ implies $MU_B = 20$.

- (7) Sam chooses to spend his entire income on food and buys no clothing. His indifference curves must therefore:
- (a) be vertical.
- (b) be horizontal.
- (c) **have a MRS greater than the price ratio where his budget line intersects the food axis.**
- (d) have a MRS less than the price ratio where his budget line intersects the food axis.
- (e) None of the above is correct.

c) For a corner solution, it is only necessary that the MRS exceed the price ratio.

(8) Kim only buys coffee and compact discs. Coffee costs \$0.60 per cup, and CDs cost \$12.00 each. She has \$18 per week to spend on these two goods. If Kim is maximizing her utility, her marginal rate of substitution of coffee for CDs is:

- (a) **0.05.**
- (b) 20.
- (c) 18.
- (d) 1.50.
- (e) None of the above.

a) At Kim's most preferred market basket, her MRS equals the price ratio ($P_{\text{Coffee}}/P_{\text{CD}}$), which equals 0.60/12 or 0.05.

(9) Which assumption about preferences tells us that a consumer's most preferred market basket will lie on the budget line, rather than below the budget line?

- (a) Completeness
- (b) Transitivity
- (c) **More is better**
- (d) Diminishing marginal rate of substitution
- (e) None of these assumptions guarantees this

c) Completeness, transitivity, and diminishing MRS describe the shape of indifference curves and their relation to each other. The assumption "more is better" insures that the consumer will continue spending all her income in order to consume more goods (i.e., reach a point on the budget line).

(10) Which of the following statements is a normative statement?

- (a) **The minimum wage is unfair in the eyes of some people.**
- (b) Changes in the minimum wage impact the unemployment rate among teenagers.
- (c) The minimum wage is \$5.15 per hour.
- (d) The real value of the minimum wage is lower in 1999 than in 1970.

(11) Which of the following statements about demand elasticity is correct?

- (a) If demand is price-inelastic, an increase in price will reduce total expenditures.
- (b) If demand is price-elastic, an increase in price will increase total expenditures.
- (c) **If demand is price-inelastic, an increase in price will increase total expenditures.**
- (d) If demand is price-elastic, an increase in price will leave total revenues unchanged.

(12) Along Engel curve:

- (a) the consumer's well-being is constant.
- (b) **the consumer's income varies.**
- (c) the well-being of the consumer may vary or may be constant. It depends on whether the good is normal or inferior.
- (d) the well-being of the consumer depends on the shape of the curve.

(13) Price elasticity of demand equal to 0.2 indicates that a 1 percent increase in price leads to a:

- (a) 2 percent decrease in quantity demanded.
- (b) 20 percent decrease in quantity demanded.
- (c) **0.2 percent decrease in quantity demanded.**
- (d) 0.2 percent increase in quantity demanded.

- (14) Joe receives a 20 percent increase in his income from his part time job and as a consequence decreases his consumption of Ramen noodles by 10 percent. Hence to Joe, Ramen noodles are a(n):
- (a) normal good with a price elasticity of demand of 0.5.
 - (b) substitute good with a cross elasticity of 0.5.
 - (c) good with a price elasticity of supply of -0.5 .
 - (d) **inferior good with an income elasticity of -0.5 .**
- (15) If Microsoft wanted to prove to the Justice Department that its Windows software has many substitutes that personal computer owners can use, Microsoft would hope to find
- (a) that the demand for Windows' is inelastic.
 - (b) that the demand for Windows is elastic.
 - (c) **a large positive value for the cross elasticity of Windows and other software.**
 - (d) a negative income elasticity for Windows.
- (16) The ABC Computer Company wants to increase the quantity of computers it sells by 5%. If the price elasticity of demand is equal to -2.5 the company must:
- (a) increase price by 2.0%
 - (b) **decrease price by 2.0%**
 - (c) increase price by 0.5%
 - (d) decrease price by 0.5%
- (17) The price of coffee rose 40 percent and the quantity of coffee demanded fell by 20 percent. Doughnut sales also fell by 20 percent. From this information, we can conclude that:
- (a) the demand for coffee is elastic.
 - (b) the demand for coffee is unit elastic.
 - (c) coffee is an inferior good.
 - (d) **the cross elasticity demand between coffee and doughnuts is -0.5 .**
- (18) A demand curve will have a positive slope when:
- (a) the good is an inferior good
 - (b) the substitution effect of a price change outweighs the income effect.
 - (c) there are many substitutes for the good.
 - (d) **none of the above**
- (19) Along a demand curve,
- (a) the consumer's total utility is constant.
 - (b) at each point the consumer's MRS is equal to the price ratio.
 - (c) at each level of consumption, the height to the demand is equal to the marginal benefit of the good to the consumer.
 - (d) **both b and c**
- (20) Engel curve will have a negative slope when:
- (a) **the good is an inferior good**
 - (b) the substitution effect of a price change outweighs the income effect.
 - (c) there are many substitutes for the good.
 - (d) none of the above
- (21) Nancy Lerner is taking a course from Professor Goodheart who will count only her best midterm grade and from Professor Stern who will count only her worst midterm grade. In one of her classes, Nancy has scores of 20 on her first midterm and 70 on her second midterm. When the first midterm score is measured on the horizontal axis and her second midterm score on the vertical, her indifference curve has a slope of zero at the point (20, 70). Therefore this class could

- (a) be Professor Goodheart's but could not be Professor Stern's.
 - (b) not be either Professor Goodheart's or Professor Stern's.
 - (c) be either Professor Goodheart's or Professor Stern's.
 - (d) be Professor Stern's but could not be Professor Goodheart's.**
 - (e) None of the above.
- (22) An Engel curve for good X describes:
- (a) how the consumption of good X varies as the price of good X changes.
 - (b) how the consumption of good X varies as the consumer's income changes.**
 - (c) how the consumption of good X varies as the consumption of good Y changes.
 - (d) how the consumption of good X varies as price-consumption curve changes.
- (23) Identify the truthfulness of the following statements.
- I. It is possible for an Engle curve to be positively sloped for a certain region of income and negatively sloped for another region.
 - II. The income elasticity of demand for a normal good is negative.
- (a) Both I and II are true.
 - (b) Both I and II are false.
 - (c) I is true; II is false.**
 - (d) I is false; II is true.
- (24) Suppose the demand for rescue services in our national parks is perfectly inelastic. This fact would mean that a 31 percent increase in rescue fees would lead to a
- (a) 31 percent decrease in the quantity demanded.
 - (b) 31 percent increase in demand.
 - (c) 31 percent decrease in demand.
 - (d) 0 percent decrease in the quantity demanded.**
- (25) During January of 2001, the average price of regular unleaded gasoline in Oakland, California increased 11.0 percent. If the price elasticity of demand for gasoline was 0.13 in Oakland during this time, the price hike means that the quantity demanded decreased by
- (a) 1.43 percent in Oakland.**
 - (b) 8.46 percent in Oakland.
 - (c) 0.16 percent in Oakland.
 - (d) None of the above answers are correct.