

Quiz #1

1/30/12

Instructions: You have 50 minutes to complete this exam. For the short-answer questions, please support your answers by showing your work and writing out complete explanations for any claims you make. Good luck!

1. If all prices double, and the amount of money you have to spend doubles, what happens to the budget line?

- a. Parallel shift outwards (to the right)
- b. Parallel shift inwards (to the left)
- c. The slope will change
- d. Both a and c
- e. Both b and c
- f. There will be no change

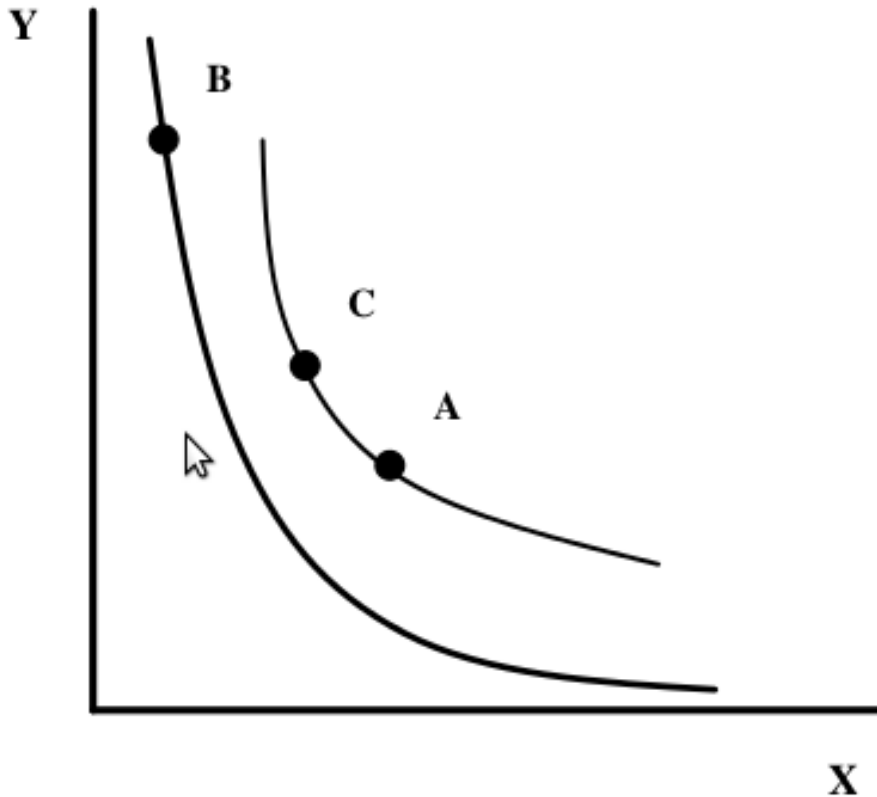
2. Gates buys two goods, apples and bananas, and the price of an apple is \$3 and the price of a banana is \$2. Gates has chosen a consumption bundle of 2 apples and 2 bananas. This bundle uses up all of Gates' income. At this bundle, Gates' marginal utility of apples is 30 and his marginal utility of bananas is 30. What must be true?

- a. Gates' current bundle is his optimal choice since the ratio of the two marginal utilities equals the ratio of consumption levels of the two goods.
- b. Gates can be on a higher indifference curve if he purchased fewer apples and fewer bananas.
- c. Gates can be on a higher indifference curve if he purchased fewer apples and more bananas.
- d. Gates can be on a higher indifference curve if he purchased more apples and fewer bananas.
- e. None of the above.

3. Georgia consumes two goods, X and Y. We know that she could afford as many as 2.5 units of X and as many as 10 units of Y, but only if she spends all her budget on X or Y, respectively. Let bundle A be (1 unit of X, 5 units of Y) and let bundle B be (1.5 units of X, 4 units of Y). Given this information which of the following is true:

- a. Bundle A is on Georgia's budget line while bundle B is not on Georgia's budget line.
- b. Bundle A is not on Georgia's budget line while bundle B is on Georgia's budget line.
- c. Both bundle A and B are on Georgia's budget line.
- d. Neither bundle A nor bundle B is on Georgia's budget line.
- e. Since we do not know Georgia's total budget, we do not have enough know whether the two bundles are on her budget line.

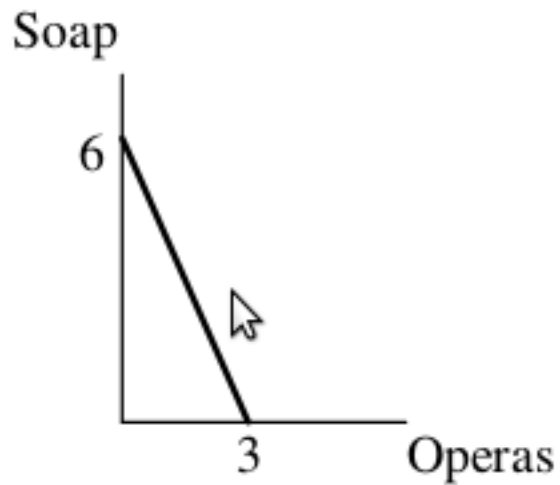
4. An individual consumes two goods, X and Y. The consumer has standard preferences over these two goods; in particular, she is made better off from the increased consumption of either good. The following graph depicts her preferences:



The points, A, B, and C, are various bundles of X and Y. Which of the following is consistent with the graph above:

- The consumer prefers bundle B to bundle C and prefers bundle C to bundle A.
 - The consumer prefers bundle B to bundle C and prefers bundle B to bundle A.
 - The consumer prefers bundle C to bundle B and prefers bundle A to bundle B.
 - The consumer prefers bundle A to bundle C and prefers bundle C to bundle B.
 - The consumer prefers bundle B to bundle C and is indifferent between bundle C and bundle A.
5. Aristotle spends his entire income on movies and popcorn. The price of a movie is \$6 and the price of popcorn is denoted as P. At these prices, Aristotle chooses his optimal bundle, which is (2 movies, 2 popcorn). We are told that at this optimal bundle, Aristotle's marginal utility of movies is 4 and his marginal utility of popcorn is 2. Given this information, what must Aristotle's income be? (Hint: You first need to find P)
- \$16
 - \$18
 - \$23
 - \$32
 - \$48

6. The following figure provides a graph of Biff's budget line for two goods, soap and operas.



We know that Biff's income is \$12. At the prices implied by the graph above, which of the following is a bundle that Biff could afford but would exhaust all of his income:

- a. 4 soap and 1 opera
- b. 5 soap and 1 operas
- c. 3 soap and 2 operas
- d. 2 soap and 2.5 operas
- e. 1 soap and 2 operas

Short answer problem 1 Ceja has utility function $u(C, L) = A^2 * B^2$ where A equals the number of apples she eats each week, while B is the number of bananas she eats each week. Ceja has \$20 to spend on fruit each week. The price of an apple is \$1, while the price of a banana is \$.25.

a. List three (A, B) points that give Ceja utility of 100. For each, say whether it is on her budget line, below her budget line, or above her budget line.

Three such points are $(A, B) = (10, 1), (5, 2), (2, 5)$. The cost of each of these points is \$12.50, \$5.50, and \$3.25, respectively, so all are below her budget line.

b. List three (A, B) points that are on Ceja's budget line. For each, say what her utility is at that point.

Three such bundles are $(A, B) = (10, 40), (15, 20), and (5, 60)$. Her utility at these bundles is 160,000; 90,000, and 90,000, respectively.

c. Pick the highest utility point from part b. At that point, what is Ceja's marginal utility of an apple? What is her marginal utility of a banana?

At $(A, B) = (10, 40)$, her marginal utility of apples is her utility from $(11, 40)$ minus her utility from $(10, 40)$, or 33,600. Similarly, her marginal utility of bananas is 8,100.

d. At the point in part c, is Ceja maximizing her utility? If not, say whether or not Ceja should consume more A or more B . Explain your reasoning.

$\frac{MU_A}{P_A} = 33,600$. $\frac{MU_B}{P_B} = 32,400$. Since these are not equal, she is not maximizing her utility at $(10, 40)$. She should consume more apples and fewer bananas.¹

¹Some students have noted that it is not possible to find another point giving a higher utility than $(A, B) = (10, 40)$. This is in fact true, and is due to the fact that we are approximating marginal utility, which is the instantaneous rate of change as A or B increase, with average rate of change as A or B increase by 1. This disparity causes us to slightly overestimate MU_A relative to MU_B . Determination of this fact is not important to understanding the question, or to receiving full points.

Short answer problem 2 Eliot regards bread (B) and cheese (C) as perfect complements. Specifically, he enjoys sandwiches with 2 slices of bread and one slice of cheese.

a. Draw a picture depicting the indifference curve through the point $B = 7, C = 2$.

[See figures on next page.](#)

b. Suppose the price of bread is \$.50/slice, while the price of cheese is \$.75/slice. Eliot has a sandwich budget of \$30. Draw his budget line.

c. Graphically depict Eliot's utility maximizing-bundle (that is, draw a picture of the relevant indifference curve and his budget line). Your picture may be approximate.

