

Homework 2

ECO 303

Due: February 23rd, 2016, 10PM

This assignment is due at the date and time indicated above. Please submit your assignment electronically using the Google form. The link of Google Form will be sent to your email. **Do not forget to check the box at the bottom of the form to send yourself a copy.** Answers to the homework will be posted to the web at the due time, and no late homeworks will be accepted. If you have any questions or concerns, please email me at wonho.yeon@stonybrook.edu or TA at shikha.rawat@stonybrook.edu.

• Budget Constraint

1. If you could afford exactly 6 apples and 14 bananas, or 10 apples and 6 bananas, then if you spent all of your income on bananas, how many bananas could you buy?
2. If you have an income of \$40 to spend, commodity 1 costs \$2 per unit, and commodity 2 costs \$10 per unit, then the equation for your bud get line can be written
 - (a) $x_1 + 5x_2 = 20$.
 - (b) $x_1/2 + x_2/10 = 40$.
 - (c) $(x_1 + x_2)/12 = 40$.
 - (d) $3x_1 + 11x_2 = 41$.
 - (e) $12(x_1 + x_2) = 40$.
3. While traveling abroad, Tammy spent all of the money in her purse to buy 5 plates of spaghetti and 6 oysters. Spaghetti costs 8 units of the local currency per plate and she had 82 units of currency in her purse. If s denotes the number of plates of spaghetti and o denotes the number of oysters purchased, the set of commodity bundles that she could just afford with the money in her purse is described by the equation
 - (a) $8s + 6o = 82$.
 - (b) $6s + 8o = 82$.
 - (c) $8s + 7o = 82$.
 - (d) $5s + 6o = 82$.
 - (e) There is not enough information to determine the answer.

4. Quincy lives on pretzels and seafood salads. The price of pretzels is 1 dollar per bag and the price of seafood salads is 2 dollars each. Quincy allows himself to spend no more than 14 dollars a day on food. He also restricts his consumption to 3,400 calories per day. There are 600 calories in a bag of pretzels and 200 calories in a seafood salad. If he spends his entire money bud get each day and consumes no more calories than his calorie limit, he can consume up to
- (a) 2 bags of pretzels per day but no more.
 - (b) 5 seafood salads per day but no more.
 - (c) 4 bags of pretzels per day but no more.
 - (d) 5 bags of pretzels per day but no more.
 - (e) None of the above.

• **Preferences and Utility**

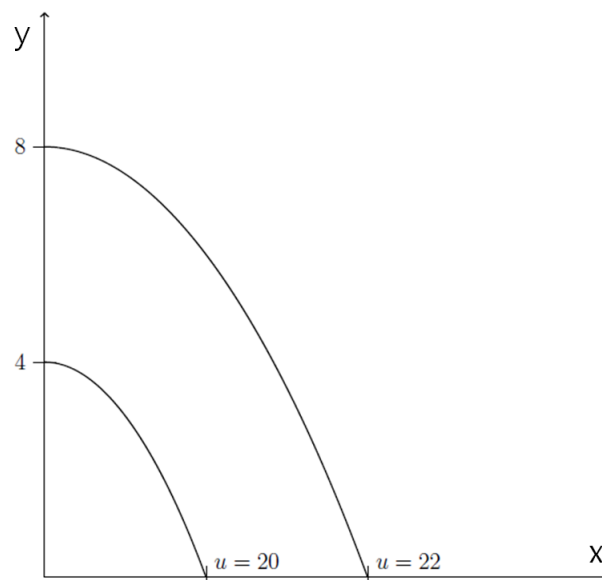
<Questions 5-7> Elmo finds himself at a Coke machine on a hot and dusty Sunday. The Coke machine requires exact change - two quarters and a dime. No other combination of coins will make anything come out of the machine. No stores are open; no one is in sight. Elmo is so thirsty that the only thing he cares about is how many soft drinks he will be able to buy with the change in his pocket; the more he can buy, the better.

5. If Elmo has 2 quarters and a dime in his pockets, he can buy 1 soft drink. How many soft drinks can he buy if he has 4 quarters and 2 dimes?
6. Does Elmo have convex preferences between dimes and quarters?
7. If Elmo had arrived at the Coke machine on a Saturday, the drugstore across the street would have been open. This drugstore has a soda fountain that will sell you as much Coke as you want at a price of 4 cents an ounce. The salesperson will take any combination of dimes and quarters in payment.(for simplicity, fractional quarters and fractional dimes are accepted at the corresponding fraction of their value.) Suppose that Elmo plans to spend all of the money in his pocket on Coke at the drugstore on Saturday. Each of Elmo's new indifference curves is
- (a) L-shaped.
 - (b) made up of two line segments with slopes -2 and $-1/2$.
 - (c) line segment with slopes -2 .
 - (d) line segment with slope -2.5 .
 - (e) is a diamond- shaped figure consisting of four line segments

8. Oswald Odd consumes only goods 1 and 2. His utility function is $U(x_1, x_2) = x_1 + x_2 + \min\{x_1, x_2\}$. Each of Oswald's indifference curves is

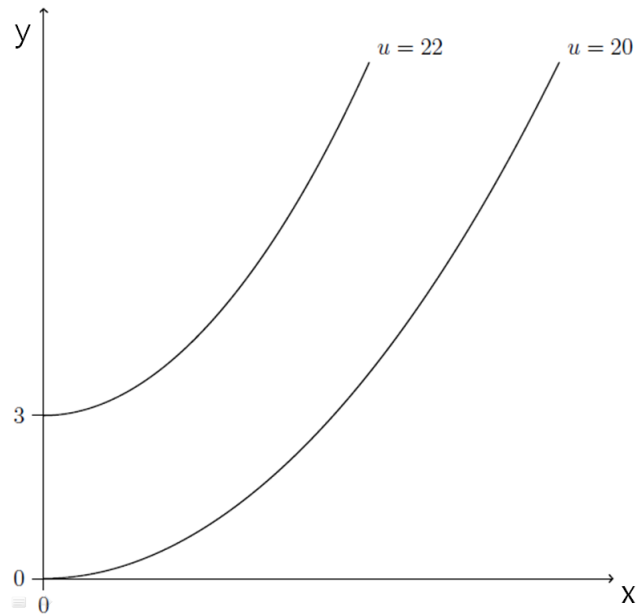
- (a) L-shaped.
- (b) made up of three line segments with slopes -2 , -1 , and $-1/2$.
- (c) made up of two line segments with slopes -2 and $-1/2$.
- (d) is smooth and has no kinks.
- (e) is a diamond-shaped figure consisting of four line segments

9. Which preference best describes the indifference curve below (always consider x to be on the horizontal axis and y to be on the vertical axis)



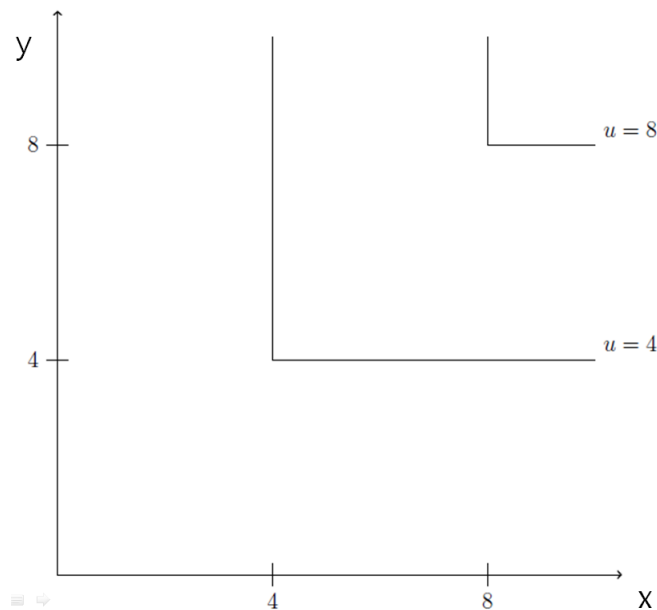
- (a) The two goods are Coke(x) and Pepsi(y). The individual can't tell the difference.
- (b) The two goods are place-mats(x) and napkins(y). To set a table, you need exactly the same number of napkins as place-mats, and extras of either cannot be used.
- (c) The two goods are cocaine(x) and money(y). The more cocaine an individual consumes, the more money they are willing to give up to get more.
- (d) Financial assets (like a stock portfolio) get a financial return(y), but are associated with a certain amount of risk(x). Less risk is better than more risk.
- (e) None of the above

10. Which preference best describes the indifference curve below (always consider x to be on the horizontal axis and y to be on the vertical axis)



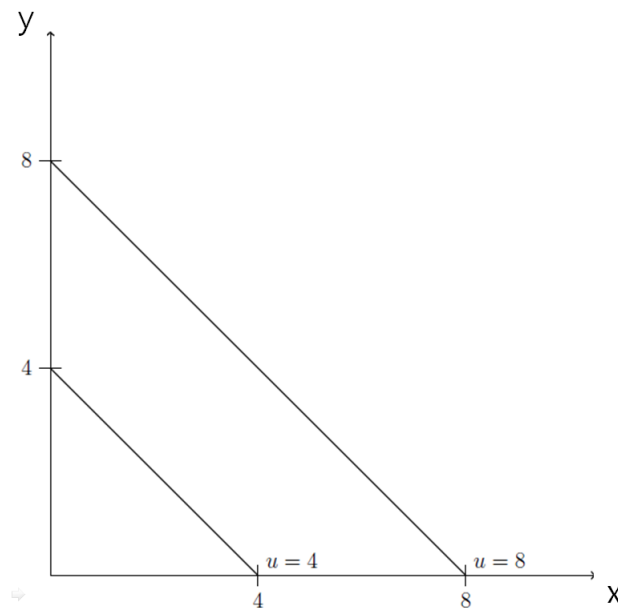
- (a) The two goods are Coke(x) and Pepsi(y). The individual can't tell the difference.
- (b) The two goods are place-mats(x) and napkins(y). To set a table, you need exactly the same number of napkins as place-mats, and extras of either cannot be used.
- (c) The two goods are cocaine(x) and money(y). The more cocaine an individual consumes, the more money they are willing to give up to get more.
- (d) Financial assets(like a stock portfolio) get a financial return(y), but are associated with a certain amount of risk(x). Less risk is better than more risk.
- (e) None of the above

11. Which preference best describes the indifference curve below(always consider x to be on the horizontal axis and y to be on the vertical axis)



- (a) The two goods are Coke(x) and Pepsi(y). The individual can't tell the difference.
- (b) The two goods are place-mats(x) and napkins(y). To set a table, you need exactly the same number of napkins as place-mats, and extras of either cannot be used.
- (c) The two goods are cocaine(x) and money(y). The more cocaine an individual consumes, the more money they are willing to give up to get more.
- (d) Financial assets(like a stock portfolio) get a financial return(y), but are associated with a certain amount of risk(x). Less risk is better than more risk.
- (e) None of the above

12. Which preference best describes the indifference curve below(always consider x to be on the horizontal axis and y to be on the vertical axis)



- (a) The two goods are Coke(x) and Pepsi(y). The individual can't tell the difference.
- (b) The two goods are place-mats(x) and napkins(y). To set a table, you need exactly the same number of napkins as place-mats, and extras of either cannot be used.
- (c) The two goods are cocaine(x) and money(y). The more cocaine an individual consumes, the more money they are willing to give up to get more.
- (d) Financial assets(like a stock portfolio) get a financial return(y), but are associated with a certain amount of risk(x). Less risk is better than more risk.
- (e) None of the above

13. Henry's utility function is $x^2 + 16xw + 64w^2$, where x is his consumption of x and w is his consumption of w .

- (a) Henry's preferences are nonconvex.
- (b) Henry's indifference curves are straight lines.

- (c) Henry has a bliss point.
- (d) Henry's indifference curves are hyperbolas.
- (e) None of the above.

• **Consumer's Problem, Optimal Choice**

14. Miss Muffet consumes two units of whey per unit of curds. (Whey and curds are complements for her.) Her utility can be expressed as $U = \min\{w, 2c\}$. If the price of curds is \$3, the price of whey is \$6 and Miss Muffet's income is \$30, what is her demand for curds?

<Questions 15-17> Carrie's utility function is

$$U = 3x + y$$

where x is cocoa and y is tea.

15. Are cocoa and tea substitutes or complements for Carrie?
16. How many mugs of cocoa are equivalent to a mug of tea in terms of her utility level?
17. If the price of cocoa is \$8, the price of tea is \$3 and her income is \$24, how many units of cocoa and tea will she consume?

<Questions 18-20> There are two goods: x and y . A consumer's utility function is

$$u(x, y) = 5x^2y + 10x^3$$

and that consumer has income of $m = 189$.

18. What is the marginal rate of substitution for this consumer?
19. Write out the Lagrangian associated with the consumer's problem.
20. If the price of good y is $p_y = 3$ and the price of good x is $p_x = 20$, find the quantities demanded by the consumer.