

UNIVERSITY OF WISCONSIN

Economics 101 – Spring 2007

Professor Brown

**Problem Set 3**

**Due by February 14-16, 2007**

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**Consumer Choice**

1. **The Budget Constraint.** Suppose Bob lives in a world with only two goods, pretzels and colas. Bob's income each month is \$300. Pretzels cost \$3 apiece and cola costs \$2 per bottle.
  - a) Graph Bob's budget constraint with pretzels on the vertical axis, and shade in the area representing all the bundles of pretzels and cola that Bob can afford.
  - b) What is the slope of Bob's budget constraint?
  - c) Suppose prices doubled while Bob's income remained unchanged. What would happen to his budget constraint? Show this on your graph.
  - d) Now suppose that Bob's income doubled, but that prices also doubled. What would happen to his budget constraint? Explain.
  
2. **Indifference Curves.** Now consider Bob's preferences. Again, he lives in a world with only 2 goods: pretzels and cola.
  - a) Draw a "normal" looking indifference map for Bob, with pretzels on the vertical axis.
  - b) What are the four properties of his indifference curves? (Hint: See Mankiw.)
  - c) Now suppose instead that pretzels and cola are perfect substitutes for Bob. Draw his indifference map on a new graph.
  - d) Give an example of two goods that are substitutes.
  - e) Now suppose that pretzels and cola are perfect complements for Bob. Draw his indifference map on a new graph.
  - f) Give an example of two goods that are complements.
  
3. **The Optimal Consumption Bundle.**

- a) (Combine your answers to questions 1c and 2a.) Draw on a new graph Bob's budget constraint and indifference map. Label his optimal consumption bundle 'A'. (You do not have sufficient information to calculate this point – just show it approximately.)
- b) How do you know point A is Bob's optimal bundle? (That is, what must be true, graphically or algebraically, at point A?)
- c) Suppose that the price of cola falls to \$1 per bottle. Draw the new budget constraint and optimal consumption bundle, and show the income and substitution effects.

**Please answer the following multiple-choice question:**

- 4. Bob consumes only pretzels and cola. Recall that the price of cola ( $P_C$ ) is \$2/bottle, and the price of pretzels ( $P_P$ ) is \$3 each. Continue to consider the case in which pretzels are on the vertical axis and cola is on the horizontal axis. As stated in lecture,  $MRS_{CP}$  = the number of units of pretzels with which the consumer must be compensated in order to give up a unit of cola and remain at the same utility level (indifferent). At Bob's optimal consumption bundle it must be true that:
  - a)  $-MRS_{CP} = -2/3$
  - b)  $2 * MRS_{PC} = 3 * MRS_{CP}$
  - c)  $-MRS_{CP} = -3/2$
  - d) The slope of the budget constraint equals the slope of the highest affordable indifference curve.
  - e) Both b and c.
  - f) Both a and d.
  - g) Both b and d.

