

## MIDTERM EXAM

ECON 210  
PROFESSOR GUSE

**Instructions.** You have 2 hours to complete the exam. There are a total of 80 points available. It is designed to take about 1 minute per point. You are allowed to reference a single page of notes, 2-sided. You may *not* use any other notes, books or aids of any kind, be they human, electronic or mechanical. Calculations may be left in expression form for full credit. There is space provided for each question. If you need additional space, you may write on the back of the pages or use additional sheets and staple them to your exam when you turn it in. Please show all of your work. (Or at least enough so that the grader can figure out how you arrived at your answers.) Please write your name on the exam itself and record the time you started and time you finished. Finally please turn in your cheat sheet with your exam.

Name:

Date and Time Started:

Date and Time Finished:

Pledge:

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*Date:* October 17, 2006.

## (1) SHORT ANSWER (10 Points)

(a) (2 points)  $(x_1, y_1) \sim (x_2, y_2)$  while  $(x_1, y_1) \succ (\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2})$ . Which standard assumption on consumer preferences does  $\succsim$  violate?

(b) (3 points) Sam faces constant prices for ham, potatoes and onions. He must give up 3 potatoes for each ham he buys and 2 potatoes for each onion. At what rate must he give up ham for onions?

(c) (3 points) State the Law of Compensated Demand.

(d) (2 Points) If the price of a good increases, the good is said to be normal if the \_\_\_\_\_ is [ greater / less ] than \_\_\_\_\_.

(2) (20 points) Norman lives for two periods. He can borrow and save at the prevailing periodic interest rate,  $r$ . Both current consumption and future consumption are normal goods for Norman. If  $r = .10$ , Norman would be a saver.

(a) (10 points) Norman will [ always / sometimes / never ] be better off if the interest rate were higher than .1 Explain using one or more diagrams if needed.

(b) (10 points) Norman will [ always / sometimes / never ] be better off if the interest rate were lower than .1. Explain using one or more diagrams if needed.

- (3) (30 points) Cookie Monster (CM) has preferences over bundles of milk (L) and cookies (C) which are represented by  $u(L, C) = \frac{1}{5} \log L + \frac{4}{5} \log C$ .
- (a) (4 pts) What are CM's demands for L and C as a functions of income ( $m$ ), the price of milk ( $p_L$ ), and the price of cookies ( $p_C$ )?
- (b) (6 pts) The price of milk is  $p_L = \$1.00$  per gallon and the price of cookies is  $p_C = \$2.00$  per pound. Draw a picture which shows Cookie Monster's income expansion path in  $L \times C$  space out to an income level of \$20 per week.
- (c) (2 pts) Due to cutbacks at PBS, Cookie Monster has fallen on hard times and his weekly income is only \$10 per week. In the same picture, draw CM's budget line and optimal consumption bundle.
- (d) (6 pts) Grover approaches Cookie Monster and offers to give Cookie Monster a gallon of milk in exchange for a half-pound of cookies. How does CM respond? Explain.

- (e) *Cookie Monster continued* (8pts) Once the public sees the television images of Cookie Monster and Grover, both emaciated and desperately hungry, reduced to bargaining over crumbs, the outcry is too much for Congress. However, instead of cash-assistance, they decide to give Cookie Monster milk stamps. (Research sponsored by the dairy industry has shown that too many cookies may cause diabetes in muppets.) Every week they give him 10 stamps, each good for one gallon of milk. Futhermore, he is forbidden from trading his milk stamps (or his milk) for cookies. Draw CM's new budget and optimal bundle.

- (f) (4 pts) At the optimal choice, what rate would CM be willing to accept cookies in exchange for giving up milk? How does this relate to the MRT in the market? Explain.

(4) (20 points) Household A has nice monotonic convex rational preferences for rice,  $x_r$ , and fish,  $x_f$ . The household's weekly demand for rice and fish are given by the functions  $x_r(p_r, p_f, m)$  and  $x_f(p_r, p_f, m)$  respectively, where  $p_r$  is the price of rice,  $p_f$  is the price of fish and  $m$  stands for the A's weekly income.

(a) (10 points) Suppose that the price of fish is fixed at  $\bar{p}_f$  and A's income is  $\bar{m}$ . When the price of rice decreases from  $p_r^H$  to  $p_r^L$ , the demand for rice falls from  $x_r(p_r^H, \bar{p}_f, \bar{m})$  to  $x_r(p_r^L, \bar{p}_f, \bar{m})$ . In other words assume that  $p_r^L < p_r^H$  and  $x_r(p_r^L, \bar{p}_f, \bar{m}) < x_r(p_r^H, \bar{p}_f, \bar{m})$ . Consider what happened to A's demand for *fish* when the price of rice decreases from  $p_r^H$  to  $p_r^L$  as just described. Which of the following is true.

- $x_f(p_r^L, \bar{p}_f, \bar{m}) < x_f(p_r^H, \bar{p}_f, \bar{m})$
- $x_f(p_r^L, \bar{p}_f, \bar{m}) > x_f(p_r^H, \bar{p}_f, \bar{m})$
- $x_f(p_r^L, \bar{p}_f, \bar{m}) = x_f(p_r^H, \bar{p}_f, \bar{m})$

Explain your answer using a diagram if necessary. What can you say about the income and substitution effects on the demand for fish?

- (b) (10 points) Suppose that in addition to the decrease in the price of rice, income changed to  $m'$  defined as follows.

$$m' = p_r^L x_r(p_r^H, \bar{p}_f, \bar{m}) + \bar{p}_f x_f(p_r^H, \bar{p}_f, \bar{m})$$

Does A prefer the budget with parameters  $(p_r, p_f, m) = (p_r^H, \bar{p}_f, \bar{m})$ , or would they rather face the budget given by parameters  $(p_r, p_f, m) = (p_r^L, \bar{p}_f, m')$ . Explain your answer using a diagram, if need be.