

Name \_\_\_\_\_  
Student number \_\_\_\_\_ Lab LF0 \_\_\_\_\_

Economics 203, F01  
Midterm #1, with suggested answers

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Time: 50 minutes

October 12, 2005  
Value: 50 points

Note: Answer all questions on the test sheet. Do all questions. Show all your work, and clearly label all diagrams. This quiz has 5 pages.

A. (24 points) Each of the following statements is either *true* or *false*. State which, and explain your choice in the space provided. Your answer should include a definition of any term in *italics*. Each is worth 8 points.

a) The assumption "more is better" means that two bundles with the same amount of good one, and different amounts of good two, cannot be on the same *indifference curve*.

Ans: True: Def'n of indifference curve: line joining all bundles which yield same level of utility to consumer; consumer values each bundle on the line equally.

"More is better" means that an individual prefers bundles with more of goods to less - thus, the two bundles above, with the same amounts of good one and different amounts of good two, yield different levels of utility/well-being/satisfaction. The bundle with the greater amount of good two is preferred by the consumer.

Since the two bundles yield different levels of utility, and all bundles on a single indifference curve have the same utility, these two bundles must be on different indifference curves.

b) The market for DVD's has *inverse supply and demand curves* given by  $p = 2q^s$  and  $p = 42 - q^d$ , respectively. At a unit price of \$20, 10 DVD's will be traded.

Ans: True: Amount traded will equal the minimum of quantity supplied and quantity demanded at a given price; if the two are equal, then the market is said to be in equilibrium. Here, quantity supplied =  $p/2=10$  at  $p=20$ ; quantity demanded =  $42-p = 22$  at  $p=20$ . Since quantity supplied is the smaller at this price, this will be the quantity traded.

Def'n: a demand (supply) curve gives the quantity demanded (supplied) as a function of the market price. An inverse demand (supply) curve inverts this relationship, to solve for price as a function of quantity demanded (supplied); this is the relationship we plot, when price is on the vertical axis.

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- c) Jim has won a ticket from the campus radio station to see a jazz band perform at an outdoor concert. Mike has paid \$18 for a ticket for the same concert. On the evening of the concert, there is a tremendous thunderstorm. If Mike and Jim have the same tastes, and both try and maximize their own *utility*, Mike will be more likely to attend the concert than Jim will.

Ans: False: Def'n: utility is the way in which economists measure the level of satisfaction or well-being a consumer/individual receives from a bundle of goods.

On the night of the concert, both Mike and Jim must decide whether attending the concert is worth the *additional* cost of sitting through the thunderstorm. The fact that Mike paid for his ticket, while Jim's was free, should be irrelevant to the attendance decision. The \$18 Mike paid is a *sunk cost*, and cannot be recovered by any action on his part - hence it is irrelevant to the current decision.

B: (26 points) Read all sections of this question before you begin. Please use at least one-half page for your diagram, and label it clearly.

Rajan spends all his money on only two goods, bananas and scones. Bananas cost \$0.60/kg, and scones cost \$0.50 each.

- a) (2) **On page 4**, sketch Rajan's budget constraint if he has an income of \$10.00/day. (Put bananas on the horizontal axis.)

Ans: horizontal intercept =  $100/6$ ; vertical intercept =  $100/5=20$ ; budget line is straight, with slope =  $-6/5$

Rajan has well-behaved preferences, and his optimal bundle contains 10 scones.

- b) (4) Illustrate his optimal bundle in your diagram for (a); label it A. Why is this choice optimal? What conditions does it satisfy?

Ans: Why optimal? Max's utility on his feasible set; Two conditions:

- i)  $MRS=(\text{price of bananas})/(\text{price of scones})$ ;  
ii) all income is spent - bundle is on budget line.

Picture: needs an IC tangent to BL at point corresponding to 10 scones.

- c) (2) How many kg of bananas does he buy? (Show how you derived this number.)

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Ans: derivation - uses budget constraint:  $0.6x_b + 0.5x_s = 10$ . Substituting in for the value of  $x_s = 10$  yields  $x_b = 50/6 = 25/3 = 8\frac{1}{3}$  kg of bananas.

- d) (3) Suppose the price of bananas doubles. In your diagram for (a), identify the total effect of this price increase on Rajan's optimal choice. (Label his new optimal bundle G.)

Ans: if price of bananas doubles, BL pivots about vertical axis; new horizontal intercept is  $100/12=25/3$ .

New optimal bundle is on new BL, where IC is tangent to BL.

Notice: there is no need for the number of scones to be the same in bundles A and G; in fact, it would be unusual if the number did not change.

- e) (6) Briefly explain the meaning of the following terms:

- i) the substitution effect of the price change on both goods;

Ans: the substitution effect measures the change in the quantity purchased in response to a change in *relative* prices. The doubling of the price of bananas, with a constant price of scones, means that bananas are now more expensive relative to scones. Because the individual is willing to make trade-offs between the two goods (the IC is negatively sloped), the increased relative price of bananas should lead Rajan to purchase more scones, and fewer bananas.

- ii) the income effect of the price change on bananas.

Ans: the increase in the price of bananas, with a fixed income and a constant price of scones, means that if Rajan chooses to purchase any bananas his real income is now lower than it was before the price increase - his budget set has shrunk. This is similar to a change in money income: the original optimal bundle is no longer attainable, and he must move to a new, lower, IC. The income effect of the price change *on bananas* reflects the change in quantity of bananas purchased as a result of the movement from the original to the new indifference curve.

- f) (4) Identify the effects in (e) on your diagram.

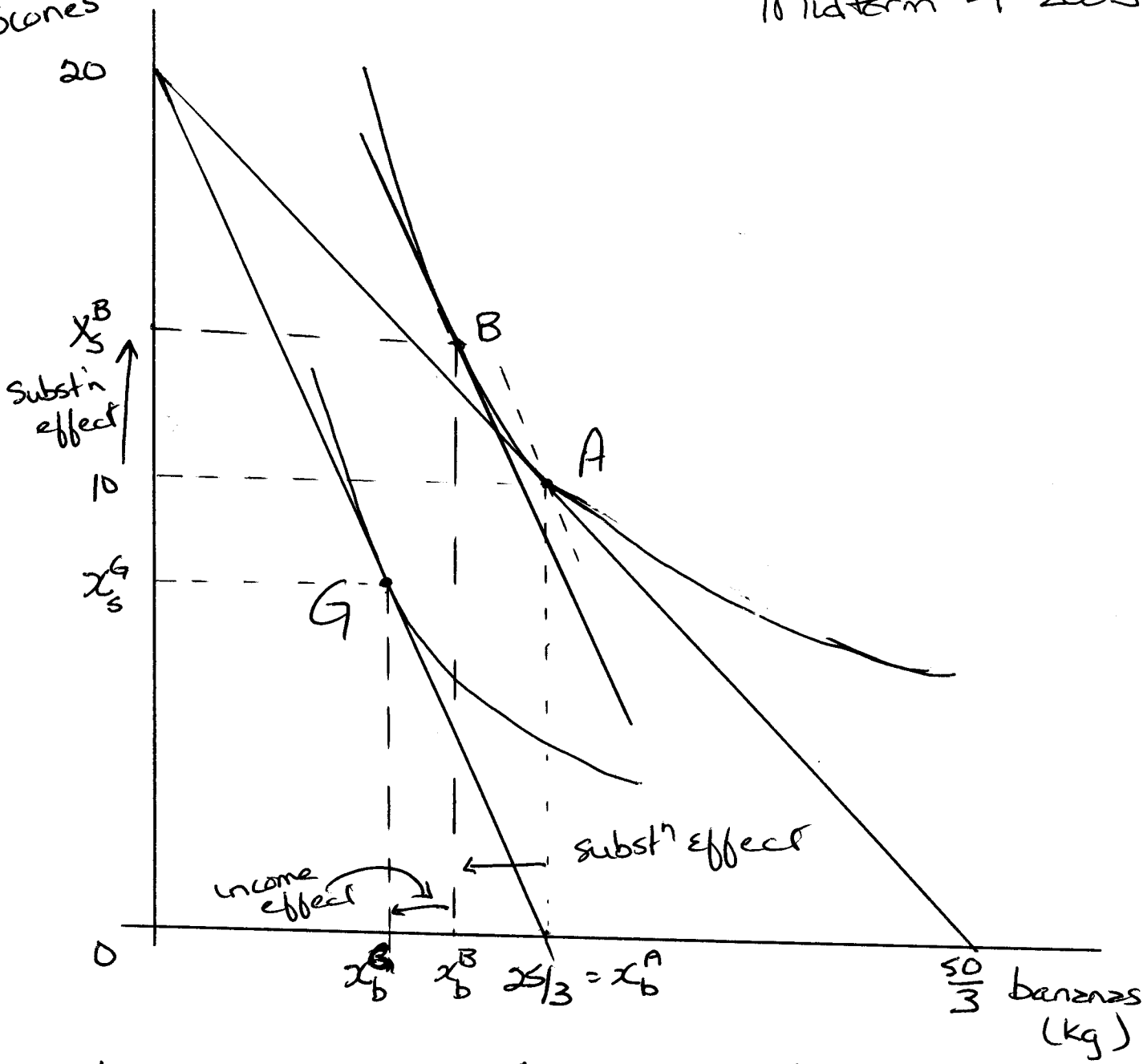
Ans: substitution effect measured along original IC, from  $MRS = 6/5$  to  $MRS = 12/5$ ; income effect measured from original to new, lower, IC, with  $MRS = 12/5$ .

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- g) (5) If Rajan's income increased so he could just purchase his initial optimal bundle at the new prices, would he choose to do so? Explain why or why not (with reference to the diagram if you wish).

Ans: No, he would not choose his initial bundle. The change in relative prices causes him to adjust his consumption to restore  $MRS = \text{price ratio}$ . Even if the original bundle is now just affordable, Rajan could attain a higher utility by purchasing fewer bananas, and more scones, than he originally did.

Scores  
 20



Initial:  $M = 10$ ,  $p_b = 0.6/\text{kg}$ ,  $p_s = 0.50$   
 New: "  $p_b = 1.20/\text{kg}$  "