

Problem set assignment



EC 109 Autumn 2011 Dr. Mani Problem Set 2 Due Date: Oct31, Monday – between 9 & 11 AM in room S 2. 132 Please keep a copy of your assignment and show all your work clearly. (1) Mr. J. Bond, a retired movie actor, consumes only grapes and the composite good Y (i. e. price of Y is ? 1). His income consists of ? 10000 a year from his investment fund plus the proceeds of whatever he sells of the 2000 bushels of grapes he harvests annually from his vineyard in Tuscany. Last year, grapes sold at ? 2 per bushel and Bond consumed all 2000 bushels of his grapes, in addition to 10,000 units of Y.

This year, the price of grapes is ? 3 per bushel (and the price of the composite good Y is the same as before). If Bond has well-behaved preferences, will his consumption of grapes this year be greater than, less than or the same as last year's? How about his consumption of the composite good? (Hint: Graph both years' budget constraints and think about whether last year's bundle is affordable to Mr. R). (2) Suppose Carmela's income is ? 100 per week, which she allocates between sandwiches and books. Sandwiches cost ? 2 each. Books cost ? 0 each if she purchases between 1 and 5 books. If she purchases more than 5 books in a week, the price falls to ? 5 for the 6th book and all subsequent books. Draw the budget constraint. Is it possible that Carmela might have more than one utility-maximizing solution? (3) Fiona requires a minimum level of consumption, to derive additional utility. For Fiona, $U(X, Y) = 0$ if $X+Y < 5 = X+Y$ otherwise. Which of our usual assumptions about well-behaved preferences are violated in Fiona's case? (4) Consider the following utility functions over goods A and B.

$U = AB$, and $V = A^2B$. Compute the MRS for each of these functions, and evaluate these at the point (3, 4). Explain whether these functions represent the same preference ordering. (Think about what the MRS at (3, 4) represents in economic terms.) In other words, is V a monotonic transformation of U ? (5) Shirley Sixpack and Lorraine Quiche are friends. Shirley thinks a 16-ounce can of beer is just as good as two 8-ounce cans. Lorraine only drinks 8 ounces at a time and hates stale beer, so she thinks a 16-ounce can is no better or worse than an 8-ounce can. a) Write a utility function that represents Shirley's preferences between commodity bundles comprised of 8-ounce cans and 16-ounce cans of beer. Let X stand for the number of 8-ounce cans and Y stand for the number of 16-ounce cans. (b) Write down a utility function to represent Lorraine's preferences. (c) Would the function utility $U(X, Y) = 100X + 200Y$ represent Shirley's preferences? How about $U(X, Y) = X + 3Y$? (6) Suppose that a typical research student at the University of Warwick lives in a two good world, books (x) and beer (y), with utility function $u(x, y) = x^{1/5} y^{4/5}$.

The price of book and beer are £ 50 and £ 10, respectively. (d) If a research student gets £ 1000 as a scholarship, then find his demand for book and beer. (e) Show that the expenditure on beer is 4 times as much as that on book. (f) Suppose the University is considering the following scheme: £ 750 is paid as fellowship and additional £ 250 as book grant. Naturally, a book grant can only be spent on books. Draw a research student's budget constraint under the new scheme. (g) Find his optimal consumption bundle under this new scheme. (7) Kinko spends all his money on whips and leather jackets.

Kinko's utility function is $U(x, y) = \min\{4x, 2x + y\}$, where x is his consumption of whips and y is his consumption of leather jackets. Kinko is consuming 15 whips and 10 leather jackets. The price of whips is \$10. You are to find Kinko's income. To do so, you may proceed in the following sequence: (h) Draw Kinko's indifference curve through his current consumption point (15, 10) - remember that the utility level on an indifference curve is a fixed number at all points on the curve. (i) Find the slope of the indifference curve at his current consumption bundle. Then arrive at your answer.