UNIVERSITY OF WISCONSIN

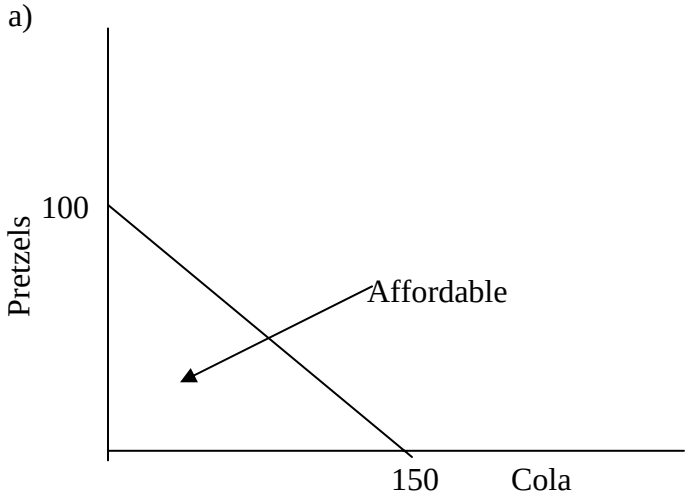
Economics 101 – Spring 2007

Professor Brown

Problem Set 3:
Answer Key

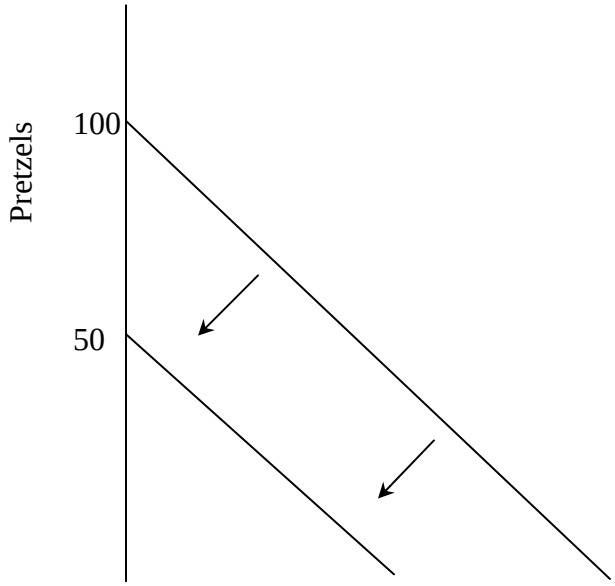
1. Recall that Bob's income each month is $300. Pretzels cost $3 apiece, and cola costs $2 per bottle.

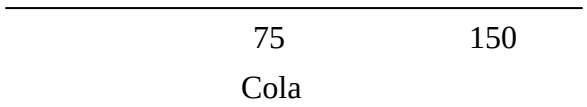
   a)



   b) The slope of Bob's budget constraint = $-P_C \backslash P_P = -2/3 = -.667$

   c) If prices doubled while income remained the same, his budget constraint would shift in as shown below. The slope of the budget constraint would remain unchanged, since the ratio of the prices remains the same.

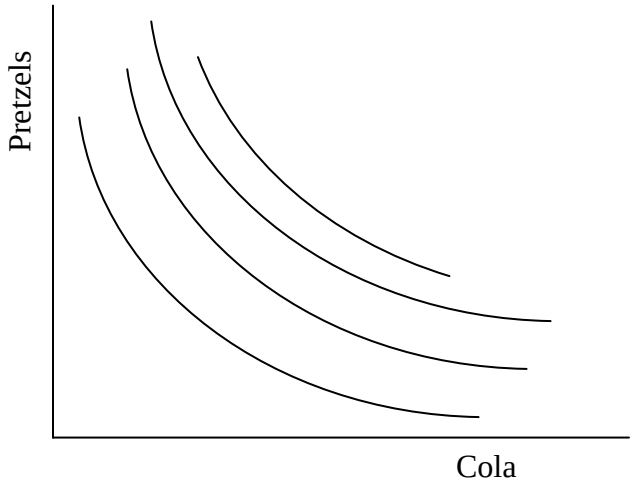




d) If Bob's income doubled, but prices also doubled, Bob's budget constraint would be the same as in part a. The vertical intercept: I/P_P = \$600/\$6 = 100 pretzels per month (the same as in part a.). Similarly, the horizontal intercept would also remain unchanged: I/P_C = \$600/\$4 = 150 bottles of cola per month.

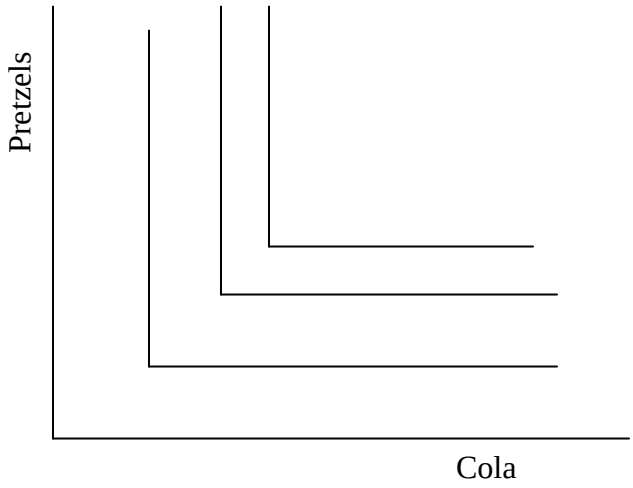
2.

a) This is a usual looking indifference map:



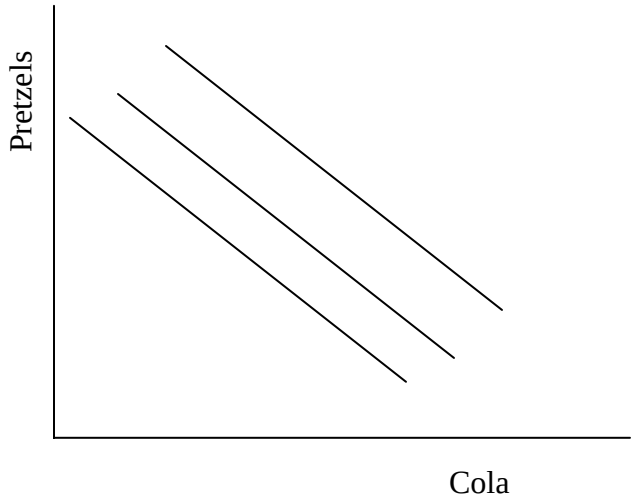
b) See Mankiw & lecture notes!

c) The case of <u>perfect complements</u>;



d) There are many examples of complements. These are goods that are consumed together. For instance: compact disks and CD players; cereal and milk; brats and sauerkraut, etc. Examples of *perfect* complements are a bit harder to come across, but there are examples here, too: Left and right shoes (or gloves), belts and belt buckles, buttons and button holes.

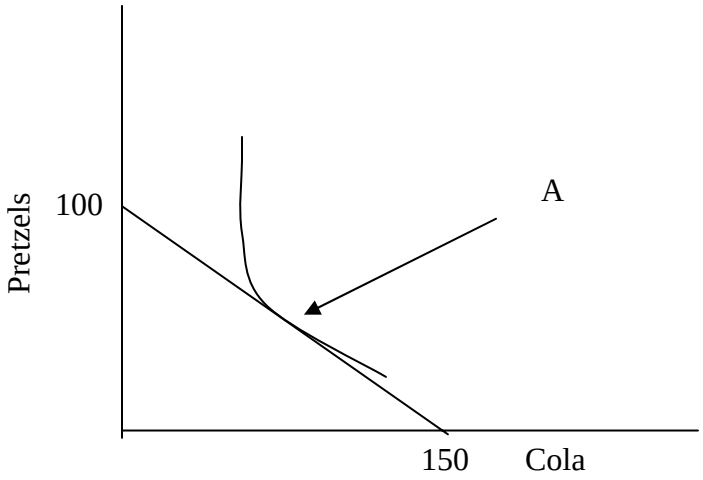
e) The case of <u>perfect substitutes</u>:



f) Again, there are many examples of substitutes: Coke and Pepsi, coffee and tea, milk and orange juice, etc.

3. **The Optimal Consumption Bundle**.

a)



b) Two things must be true for A to be Bob's optimal bundle: At A Bob must be on his budget constraint, and the indifference curve passing through point A must be tangent to (having the same slope as) his budget constraint. Algebraically,

Slope of budget constraint = Slope of indifference curve at point A

$-P_C \backslash P_P$ = - Marginal Rate of Substitution at point A

Notice that this is the condition for optimality from lecture. That is, the graphical interpretation of the optimal consumption bundle – that the slopes of the indifference curve and the budget constraint must be equal at point A, is saying the same thing as the algebraic condition – that at the optimal consumption bundle the negative of the marginal rate of substitution, which is the slope of the indifference curve at the optimal point, must equal the negative of the price ratio, which is the slope of the budget constraint at the optimal point and at every point on the budget constraint.

Please answer the following multiple-choice question:

4. f. (See answer to 3 b for explanation.)