

Econ 301 Intermediate Microeconomics

# Problem Set 1

## Problem 1. (Chapter 1)

Question 4 from Chapter 1, Varian (our textbook), pp. 19.

Note: I did not cover Chapter 1 in class. You are expected to read Chapter 1 carefully and solve this problem.

## Problem 2. (Murphy's budget set)

Murphy spends his total monthly income of \$100 on two commodities: french fries and beef jerky. The price of a portion of french fries is \$2 and beef jerky is \$5 (per pack).

- a) Write down Murphy's budget constraint.
- b) Find the maximal consumption of french fries (this number is called a real income in terms of french fries)
- c) Find the maximal number of packs of beef jerky possibly consumed by Murphy (a real income in terms of beef jerky)
- d) In a two-dimensional coordinate system, in which beef jerky is measured on the vertical axis and french fries on the horizontal one, draw a red budget line. Using pencil, show all the bundles that are affordable (the budget set). Where can we find the quantities you found in a) and b) on the graph?
- e) What is the slope of the budget line? How would you interpret it?
- f) Because of the Mad Cow Disease, the price of beef jerky increases to \$10 (due to the smaller supply of beef). On a separate graph, plot and show how the Murphy's budget set is affected? Is the shift parallel? What is the new relative price of french fries in terms beef jerky?
- g) Because of severe shortages in the supply of beef, a "Jerky" Bill is passed by the US Congress, allowing each consumer to purchase at most 5 packs. Show on the graph how the new legislation affects Murphy's budget set.

## Problem 3. (Budget set with taxes)

Amy receives a yearly stipend of \$2000 from the UW-Madison. She spends it on milk (\$1 per bottle) and punk rock CDs (\$20 each).

- a) What is the relative price of a CD in terms of milk?
- b) Draw Amy's budget set (CD on the horizontal axis).
- c) In order to reduce noise in Madison area, the governor of Wisconsin imposes an ad valorem sales tax on punk rock CDs, with the rate of 100%. How is Amy's budget set altered by the new regulation? What is the new relative price of CD?
- d) Amy's sister Priscilla currently living in California, after learning about a new tax in Wisconsin, decides to help Amy, by sending her 5 CD. Draw Amy's new budget set, taking into account the present from California (assume that the tax still holds).

**Problem 4. (Indifference Curves)**

Use a coordinate system with ice cream measured on the horizontal axis and chocolate on vertical one to illustrate your preferences by plotting indifference curves if

- a) you like both ice cream and chocolate a lot.
- b) You like ice cream, but you hate chocolate
- c) You like ice cream, but you do not care (you are indifferent) about the chocolate
- d) You always eat ice cream and chocolate in the same proportion (1:1)
- e) What is the sign of MRS in each of the first three cases?

**Problem 5. (Convexity and monotonicity)**

a) Consider *Figure 3.4* (pp. 40) from Varian. Are the preferences depicted in this graph convex? Strictly convex? Monotone? Justify your answer using the graphs.

- b) Repeat the same exercise for preferences depicted in *Figure 3.7* (pp. 43).