Econ 301
Intermediate Microeconomics
Prof. Marek Weretka

Problem set 4
(due Tuesday, February 16th, before class)

Problem 1
As in the previous problem set, Benjamin spends his time either watching movies \((x_1)\) (as you know he is taking advantage of "on demand" option, cable TV) or listening to the songs - MP3 downloaded from the Internet \((x_2)\). His preferences are

\[ U(x_1, x_2) = 4 \ln x_1 + \ln x_2. \]

His total income is \(m = 100\); the price of MP3 is one dollar (per each song) \((p_2 = 1)\). Suppose that the price of a movie drops from \(p_1 = 10\) to \(p_1 = 5\):

a) By how much the “consumption” of movies changes due to the price drop?

b) Are movies ordinary or Giffen goods? Explain why.

c) By how much \(x_1\) changes because movies are cheaper relative to MP3 (find substitution effect)

d) How about the effect of increased purchasing power of Benjamin’s income? (find income effect)

e) Is the income effect in d) positive or negative? Why? (Hint: is a movie a normal or inferior good?)

f) Show the total change, and the substitution and income effects on the graph.

Problem 2
Consider Trevor from our previous problem set. He begins a day with a strawberry milkshake (milk and strawberries mixed in proportion 5:1). His income is equal to \(m = 200\), and one strawberry costs \(p_2 = 1\).

Suppose the price of milk drops from \(p_1 = 15\) to \(p_1 = 5\).

a) What is the total change in demand for milk.

b) What is a substitution effect

c) How about income effect

Problem 3
Kate is not sure how many hours she should spend at work and we have to help her. Her total available time is 24h. She has no other source of income but salary. She is a lawyer, and a current wage rate for lawyers (per hour) is \(w = 100\). She only consumes bananas that cost \(p_c = 5\) per pound.

a) what is her real wage rate (wage rate in terms of bananas?)

b) show her budget set on the graph.

Suppose her utility function is

\[ U(C, R) = R \times C \]

where \(R\) is leisure (or relaxation time) and \(C\) is consumption of bananas.

Find her optimal time spent at work, the relaxation time and consumption of bananas.

c) How your answer in c) would change if her wage rate was \(w = 200\)? How would you explain the change (or possibly no change) in her labor supply?