Prof. Marek Weretka's

Econ 301 Intermediate Microeconomics

Problem Set 5

Problem 1

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.

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

d) 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?

Problem 2 (Intertemporal Choice)

Gerald is a CEO in Brainies Consulting Inc. His income in the first year is $\omega_1 =$ \$200 and in the second $\omega_2 =$ \$200. Assume that the interest rate is $r = 100\%$: (His time horizon is limited to these two years.)

a) Find PV and FV of Gerald's income.

b) Show on the graph $(C_1; C_2)$ Gerald's budget set. Mark PV, FV and the slope of his budget line

c) Explain what borrowing/lending strategy gives Gerald each of the two "extreme" consumption points. (how much does he borrow/lend in the first period, how much does he pay back/ receive in the second period?)

d) Suppose his utility function is

$$U(C_1; C_2) \ = \ \ln C_1 + \ln C_2$$

Find analytically Gerald's optimal choice and show it on the graph. Does the optimal consumption involve saving or borrowing? Find optimal savings S

Problem 3 (Intertemporal Choice)

The preferences of a manager and a sportsman are given by

$$U(C_1; C_2) \ = \ \ln C_1 + \frac{1}{1+\delta} \ln C_2$$

Suppose $r = \delta = 100\%$.

a) Give economic interpretation to coefficient δ.

b) Derive the optimal consumption plan of a manager (C_1, C_2) if his income in two periods is given by $\omega = (0, 3000)$. Find optimal level of savings S in the first period.

c) Derive optimal consumption plan of a sportsman, (C_1, C_2) if his income in two periods is given by $\omega = (1500, 0)$. Find optimal level of savings in the first period.

d) Are the manager and the sportsman smoothing their consumption profiles?

e) Show, using one of the secrets of happiness, that the optimal consumption of the manager is decreasing over time when $r < \delta$.