73230 Intermediate Microeconomics
Problem Set 1

Anh Nguyen

Due: In-class at 10:30am on February 06, 2019

Problem 1 (50 pts)

This question concerns a consumer who is choosing how many of two goods to buy: watermelon and orange. The consumer has an income of \$20, and the cost of a watermelon is \$4 and an orange is \$2.

(a) (10 pts) Write down the equation for the consumer's budget constraint and graph it in the commodity space

(b) (10 pts) The government decides that watermelon is evil and needs to be taxed. They introduce a 50% tax on each watermelon sold. Rewrite and regraph the budget constraint.

(c) (10 pts) A new government is elected that hates all fruits. They now tax both watermelons and oranges at 50%. Rewrite and regraph the budget constraint.

(d) (10 pts) Due to a threat of revolt amongst fruits fans, the government hands out a subsidy of \$10 to the consumer but still tax both watermelons and oranges at 50%. What does their new budget constraint look like? How would you expect consumer behavior to differ between this situation and the no-tax, no-subsidy situation described in part (a)

(e) (10 pts) Revolution comes, and all taxes and subsidies are abolished. Even better, the consumer finds a new shop that offers bulk discounts. In this shop, watermelons cost \$4 each if you buy 3 or fewer. However, the cost of any additional watermelon after 3 is \$2. Rewrite and regraph the budget constraint.

Problem 2 (30 pts)

Edmund consumes two commodities, garbage and punk rock video cassettes. He doesn't eat garbage of course, but he gets paid for taking it away at \$2 per 1 sack. Edmund can accept as much garbage as he wishes at that price. He has no other source of income. Video cassettes cost him \$6 each. He has a utility function $u(g, v)$ on garbage (g) and videos (v) which is decreasing in g and increasing in v.

(a) (10 pts) If Edmund's accepts 0 sacks of garbage, how many video cassettes can he buy?

(b) (10 pts) Write down Edmund's constrained optimization problem

(c) (10 pts) Draw Edmund's budget line and shade his choice set.

Problem 3 (20 pts)

Suppose Bryan consumes bread (x_1) and olive oil (x_2) with his income. His utility function over these two goods is:

$$u(x_1; x_2) = x_1^2 x_2^2$$

The price of a unit of bread is $p_1 = 3$, and the price of a unit of olive oil is $p_2 = 5$. Bryan has \$20 to spend. How much bread and olive oil will Bryan consume?