

Homework 1

Due: Wednesday, September 21, in lecture

Note: You can always hand it in early, but no homeworks passed the due time will be accepted

1. [37] Oscar consumes two goods: $x_1 =$ (hotdogs), and $x_2 =$ (ice tea). Suppose the price for each hotdog is $p_1 = \$0.5$ and the price for each bottle of ice tea is $p_2 = \$3$. Oscar has a weekly income of $m = \$120$.
 - (a) [6] Write an mathematical expression representing all the bundles that is on Oscar's budget line.
 - (b) [6] Write an mathematical expression representing all the bundles that Oscar can afford.
 - (c) [8] Graphically illustrate Oscar's budget set. *Make sure you label all axis and intercept.*
 - (d) [12] On the same graph as in part (c), graphically illustrate how each of the following changes affect Oscar's budget set. *Use a different color pen for each part of this question, and label your answer on the graph. Make sure you label all axis, intercepts.*
 - i. Income increased to $\widehat{m} = \$180$.
 - ii. Price of hotdogs increased to $\widehat{p}_1 = \$1$.
 - iii. Price of ice tea decreased to $\widehat{p}_2 = \$2$.
 - (e) [5] Given the original prices and income $(p_1, p_2, m) = (0.5, 3, 120)$, what is Oscar's opportunity cost of consuming an extra bottle of ice tea?
2. [25] Shirley loves to party and consumes only two goods: $x_1 =$ (bottles of beer) and $x_2 =$ (packs of cigarettes). The price of each bottle of beer is $p_1 = \$2$ and the price for each pack of cigarettes is $p_2 = \$6$. Assume Shirley has an weekly income of $m = \$300$.
 - (a) [8] Suppose the government decides to ration the amount of cigarettes each consumer can buy to be no more than 55 packs per week. Graphically illustrate Shirley's budget set under this rationing constraint.
 - (b) [12] Suppose instead of the rationing as in part (b), the government decides to levy a value tax of 50% on each bottle of beer brought in excess of 90 bottles per week (More specifically, this value tax only applies to each additional bottle of beer Shirley buys after the 90th bottle). Graphically illustrate Shirley's budget set under this tax scheme. If Shirley spends all her money on beer, how many bottles of beer at most can she afford? *Label all axis, intercepts, and "kinks", if any.*
 - (c) [5] Under the value tax as described in part (c), what can Shirley do to avoid paying this tax?

3. [22] Clearly answer the following questions:
- [6] Explain what it means for preferences to be “Rational”.
 - [8] Explain what it means for preferences to be “Well-Behaved”.
 - [8] A superficial girl says that given any two men, A and B , she always prefer the one who is taller and richer. Based on this preference relation, are her preferences complete? Are her preferences transitive? Explain.
4. [8] Amy consumes $x_1 =$ (apples) and $x_2 =$ (oranges), and nothing else. Suppose Amy’s preferences is such that she is always willing to substitute five apples for two oranges. Graphically illustrate all the bundles that Amy prefers equally as the bundle $(10, 6)$. *Label all axis, intercepts (If applicable), kinks (If applicable), and at least two bundles on that indifference curve.*
5. [8] Bob consumes $x_1 =$ (Beer) and $x_2 =$ (chips), and nothing else. He always consumes 1 beer with $\frac{1}{2}$ bags of chips together. Graphically illustrate all the bundles that Bob prefers equally as the bundle $(4, 4)$. *Label all axis, intercepts (If applicable), kinks (If applicable), and at least two bundles on that indifference curve.*

Extra Credit Question: [10 Points]

Stan is considering getting a cellphone. Let $x_1 =$ (cellphone airtime minutes per month); and $x_2 =$ (\$ spent on everything else). Suppose Stan has a monthly income of \$300. His only local cellphone company is offering two different calling plans he can choose from:

- **Plan A:** \$30 one-time activation fee; \$0.25 per minute airtime.
- **Plan B:** \$50 one-time activation fee; The first 100 minutes of airtime are free; and \$0.50 per minute for each additional minute of airtime used after the first 100 minutes.

Stan cannot make any calls (i.e. use any airtime minutes) unless he enrolls in one of the plans described above. To use any airtime minutes with each of the plans, Stan must pay the activation fee. Once Stan pays for the activation fee, he can elect to use as much (or as little) airtime as he can afford. A cellphone comes with each of the calling plans free of charge. And at last, Stan can always choose to not get a cellphone (thereby not enroll in any of the two plans).

Graphically illustrate all the feasible bundles (x_1, x_2) for Stan. Make sure you label all axis, intercepts, kinks (If applicable).