# Homework 1

## AEC 504 - Summer 2007

## Fundamentals of Economics



## 1 Hard Charity

Fairy Godmother has recently retired and moved from Far Far Away, CA to Rochester, NY. Fairy Godmother receives her retirement benefit by-weekly. Every second Friday evening she cashes in her paycheck of $1,500 and drives to Pittsford Plaza, where she buys some consumer goods and donates the rest to Salvation Army. Her utility function is $U = G^{2/3}D^{1/6}$, where G is the dollar value of consumer goods purchased and D is the number of $10 bills donated.

i. Compute the optimal allocation of Fairy Godmother's money between purchases and donations

ii. Suppose now that the charity gatherers have left Pittsford Plaza, and Fairy Godmother has to drive to downtown Saturday morning to make her donation. The trip costs her $20 (including the price of Medieval combo, which brings her no utility whatsoever). Show graphically what happens to the optimal allocation

iii. Suppose now that Salvation Army accepts credit cards, but charges 5% fee for a donation made via credit card. Show graphically what happens to the optimal allocation. Draw a graph showing that it is better for Fairy Godmother to pay with credit card than to drive downtown and pay no percentage fee (you do not have to prove that she is really better off paying with credit card, but you graph should show she is)

iv. Is there any fee schedule (fixed, as in (ii), percentage, as in (iii), or a combination of both), which would make Fairy Godmother donate nothing?

## 2 Much Ado about a Budget Line

A schoolgirl spends her pocket money of \$20 per week on movie tickets and sundaes. A movie ticket costs \$5, and a sundae costs \$2. Show graphically the change in her budget constraint for the following events (consider one event at a time):

i. The price of a sundae increases to \$2.50.

ii. The schoolgirl finds a \$5 bill on the pavement.

iii. In addition to the pocket money, Dad buys her two movie tickets and three sundaes a week. The girl cannot sell what Dad gives her to somebody else.

iv. Being busy, Dad does not go to see the movie with her, and she figures out she can sell the tickets Dad buys her to her classmate for \$4. The sundaes Dad buys her still have no resale value.

v. The movie theater introduces a discount program: for everyone buying more than two movie tickets per week each movie ticket starting with the third one gives the right to see another movie for free.

vi. The movie theater changes the discount program to give everyone buying more than two tickets per week 50% discount on the tickets purchased afterwards.

P.S. Fractional sundaes and movie tickets are OK.

## 3 Catch-22

Captain Yossarian makes \$6,000 per year and spends it on buying wine and making trips to Rome. A case of wine, $W$, costs \$100 and a trip to Rome, $R$, costs \$300. The utility function of Yossarian is $U = \sqrt{W} + \sqrt{R}$. (Fractional trips and cases are OK).

i. How many cases of wine does Yossarian buy per year? How many trips to Rome he makes?

ii. Colonel Cathcart notices that officers cannot fly combat missions while they are drinking wine or are making trips to Rome. Therefore, he endows each officer with exactly 22 coupons for a year. A coupon buys a case of wine or two trips to Rome, and you still have to pay the money. The coupons are not tradable. Draw Yossarian's budget constraint. Compute his optimal consumption bundle after the coupons are introduced.

iii. Milo Minderbinder somehow gets an unlimited number of coupons and begins to trade in them at \$50 per coupon. Redraw Yossarian's budget constraint. Will Yossarian buy or sell coupons? What is his optimal consumption bundle now?

iv. Use the revealed preference principle to rank Yossarian's wealth in (i), (ii), and (iii).

v. Disaggregate Yossarian's change in the wine consumption and the trips to Rome from (i) to (iii) into the income effect and the substitution effect. Support the numerical answers with economic intuition.