

Problem Set 3

Out: Wednesday, September 8, 2004.

Due: Wednesday, September 15, 2004.

1. Below you are given pairs composed of a cost function and a utility function.

- (a) $c(y) = 1/2y^2$ and $u(m, y) = m + \ln(y)$
 (b) $c(y) = e^y$ and $u(m, y) = m + 2\sqrt{y}$
 (c) $c(y) = 1/2y^4$ and $u(m, y) = m + 2y(10 - y)$.

For each such pair

- (a) find and draw the corresponding supply and demand functions for y
 (b) calculate the competitive equilibrium of the market
 (c) check that the competitive allocation maximizes the social surplus.
2. A prestigious economics department has been awarded 3 parking spots in the “coolest” parking lot. This means that the department can sell 3 parking permits to its members and do with the money what it pleases. Unfortunately, there are 6 professors in the department wanting to park in the desired parking lot. The 6 professors differ in their names, their willingness to pay and in their seniority (the length of time they have belonged to the department). The relevant information is given in the following table.

Name	Willingness to pay	Seniority
Rhea Tards	200	10
Joe D. Mand	190	12
Juan A. Trade	180	15
Lou R. Price	180	14
R. Ann Dee	160	16
Marv Allous	150	5

- (a) If the department allocated the parking permits according to the competitive equilibrium, what would the equilibrium price and quantity be?
 (b) Who would buy the permits and who would not?
 (c) What would the consumer surplus be of each of the faculty members?
 (d) What would the revenues accrued to the department be?
 (e) What would happen to the equilibrium if the university decided to tax the permit holders \$5 per permit? Will the professors be hurt by such a measure? Will the department’s revenues change as a result?

It was argued in a faculty meeting that the competitive equilibrium shows no respect for seniority, and further, that the competitive price is outrageously high. As a result, the department decided to lower the price of a parking permit to \$100 and to allocate them according to seniority: faculty with more seniority have priority; if a “younger” faculty member wants a parking permit, he should wait until a more senior faculty member holding a permit retires.

- (a) What faculty members will get a permit?

- (b) What is the consumer surplus of each of the faculty?
 - (c) What is the revenue that accrues to the department?
 - (d) Find a mutually beneficial trade between a permit holder and a permitless faculty member.
 - (e) Does the new seniority-based allocation mechanism result in an efficient allocation of permits?
3. Every year the *Immigration and Naturalization Service* of Rodrigombia gives away one permanent resident permit (also known as pink card) by means of a lottery. This pink card is very valuable because it allows people from foreign countries (also known as non-resident aliens) to live and work in Rodrigombia, the land of opportunity. This year there are three applicants. The following table shows their respective names, their estimated earnings if they become lawful permanent residents of Rodrigombia, and their present earnings in their countries of origin.

Name	Estimated wage in Rodrigombia	Wage in country of origin
Tadeo Isidoro Cruz	\$200	\$100
Pierre Menard	\$250	\$200
Emma Zunz	\$180	\$90

- (a) For each applicant, what is his/her willingness to pay for the pink card?
- (b) What is the expected “surplus” of the applicants from the lottery (the average of their surplus)?
- (c) If Rodrigombia allocated the resident permit according to the competitive equilibrium, ...
 - i. what would the equilibrium price and quantity be?
 - ii. who would buy the permits and who would not?
 - iii. what would the surplus of each of the applicants be?
 - iv. what would the revenues accrued to Rodrigombia be?
- (d) Which method do you think is better. Explain.