- One user (A) has decided to start a honey business, and therefore has set up a beekeeping facility. The marginal cost to A is MC= 10 + 2Θ, where Θ is the number of hives he keeps. Each hive yields €20 of honey.
- a) How many hives will A have?
- b) Coincidentally there is an orchard next to A's new business, and each hive A keeps will pollinate one acre of apple trees. The orchard owner must pay €10 per acre to artificially pollinate those acres not pollinated by A's bees. What kind of Externality do A's bees generate? Specify consumption or production, positive or negative.
- c) What is the marginal social benefit of each hive?
- d) Compute the socially efficient number of beehives.
- e) What kind of measure can the Government implement in order that the efficient number of hives to be reached? Quantify.
- 2. One hundred commuters need to use a strip of highway to get to work. They all drive alone and prefer to drive in big cars it gives them more prestige and makes them feel safer. However, bigger cars cost more per mile to operate, since their gas mileage is lower. Worse yet, bigger cars cause greater permanent damage to roads. The weight of the car is w. Suppose that the benefits from driving are 4w, while the costs are 3/2w². The damage to roads is 1/3w³. Assume that each agent's utility is simply the net benefits from driving a car of a given size.
- a) What car weight will be chosen by drivers?
- b) What is the socially optimal car weight? Is it different to the one you found in (a)? Why?
- c) Can you design a toll system that makes drivers to choose the right size of their cars? If so, how would this work?
- 3. Suppose there are 100 homeowners living on the lake shore. Each has an MRS = 6 x, where x is the number of tankfuls that are sprayed. Suppose that the cost of the mosquito spray is \$100 for every tankful.

a) What is the Pareto efficient amount of spray?

b) How much will actually be sprayed if each homeowner chooses on the basis of just his own benefit from the spray?

4. Three consumers, Carlos, Maria and Eduardo live on Short Street. They are considering building a park at the corner of the street by the lake. Their demand curves for the park are given by the following equations, respectively:

Carlos: P=160–Q; Maria P=45–Q; Eduardo: P=45–2Q

The total cost of building the park is given by C(Q) = 135Q, Q represents the area in terms of square feet that will be allocated to the park.

- a) What is the optimal area to be allocated to the park? Represent your solution graphically.
- b) If the costs were to be financed by a Lindahl prices, how much would each pay?
- c) Suppose now that the three neighbours had agreed that the park should be financed by equal contributions by each of the beneficiaries: each should pay 1/3 of the total cost. Furthermore, the decision to build the park or not is to be taken by a majority vote. How will each individual vote? Explain. Will the park be built? Why? Explain carefully