



## Part II: Should we build the bridge? (60 points – 30 minutes)

The demand function for the bridge is

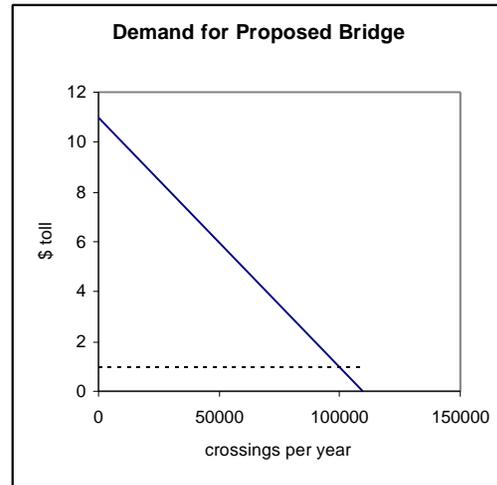
$$q = 110,000 - 10,000p,$$

where  $p$  is the toll and  $q$  is the number of crossings per year; i.e., the inverse demand curve is

$$p = \$11 - q/10,000.$$

The annual cost of operating the bridge (including maintenance and the amortization of the construction costs) will be

$$C = q + \$200,000$$



Note: Please show your computations in order that you may receive partial credit even if you should make a numerical error.

1. When the bridge project is discussed at the state capital, Senator Bull Mouse argues that the right to build and operate the bridge should be auctioned off. The successful bidder will be responsible for building and maintaining the bridge. In return for assuming these responsibilities the bridge entrepreneur will be free to charge whatever toll he chooses. The right to operate the bridge will go to the entrepreneur who offers the highest annual fee to the state.
  - a. If the Senator's suggestion is followed, the successful bidder will charge a toll of \_\_\_\_.
  - b. With this toll,  $q =$  \_\_\_\_ people will cross the bridge each year and total revenue will be \_\_\_\_\_. Consumer surplus will be \_\_\_\_\_.
  - c. The cost of operating the bridge will be \_\_\_\_\_ and the excess of revenue over cost will be \_\_\_\_\_.
  - d. The maximum bid (in dollars per year) that the state might expect to receive from entrepreneurs hoping to win the privilege of operating the bridge is \_\_\_\_\_.
  
2. Senator Dupuit argues that welfare will be maximized if the state builds and operates the bridge and charges a toll of \$1.00.
  - a. With this toll,  $q =$  \_\_\_\_ people will use the bridge and consumer surplus will be \$\_\_\_\_\_.
  - b. The cost of operating the bridge will be \$\_\_\_\_\_, revenue will be \$\_\_\_\_\_, and the shortfall of \$\_\_\_\_\_ will have to be paid for with general tax revenue.

3. Senator Giveaway argues “The bridge will belong to our people. In order that the poor will be able to enjoy their right to cross the river, we must never charge a toll on the people’s bridge.”
- a. If Senator Giveraway’s suggestion is followed,  $q = \underline{\hspace{2cm}}$  people will cross the river and operating costs will be \$          .
- b. Consumer surplus of \$           will be generated?
4. Congratulations! The Governor has appointed you to serve on a Special State Bridge Commission charged with reviewing the question of whether the bridge should be built and how it should be financed. What will you recommend? Explain carefully.