

Assignment 1

Partial Solutions

2. Mary's monthly demand for yoga is given by $P = 60 - 2Q$ where P is price per session and Q is the number of sessions she is willing to attend per month.

- (a) Suppose White Lotus is the only yoga studio in Mary's town. What is the maximum amount that the studio can charge for a fixed package of 15 sessions.

The definition that you should use here is the total value of a fixed quantity, which gives you answer 675. Answer 30 is wrong because 30 is the the maximum she will pay for the 15th session, not for 15 sessions.

- (b) Now suppose that another studio opens in Mary's town. Green Tara offers yoga sessions at price of 30 dollars per lesson, no membership fees. Calculate how many sessions Mary demands if she goes to Green Tara, how much money she will spend and her consumer surplus in the studio.

*Substitute $P=30$ into the demand to find that at this price she demands $Q=15$ sessions.
Her EXPENDITURE= $P \times Q=450$
 $CS=TV-EXPENDITURE=225$.*

- (c) Given your calculations for parts (a) and (b), to which studio will Mary go? Shortly explain your answer using the concepts introduced in class.

Recall the meaning of consumer surplus. It is calculated as total value of the purchase minus the money spent and is a measure of 'consumer's happiness obtained from shopping'. In part (b) her CS is 225 while in part (a) she does not enjoy any surplus at all as her expenditure on yoga is exactly equal to the value of going there for 15 times.

- (d) Suppose that White Lotus wants to use the following pricing strategy: offer unlimited yoga time and charge fixed membership¹. Calculate maximum membership fee that White Lotus can charge. Note: if Mary does not like the deal, she can always go to Green Tara and pay 30 dollars per lesson.

¹There no charge per class, Mary can go as many times as she wants per month, she has to pay fixed membership fee.

Mary has an option to go to Green Tara where she will get CS of 225. This means that if White Lotus wants Mary as a customer, with the unlimited membership she should have CS at least as high as 225 (otherwise Mary will go to Green Tara).

Effective price per session is zero, she will go to yoga 30 times per month and the total value of 30 sessions is 900.

With membership CS is calculated exactly the same way as with a purchase at a per unit price: $CS = TV - EXPENDITURE$. The only difference is that expenditure in this case takes form of membership fee. CS must be at least 225. Thus:

$$CS = TV - FEE$$

$$225 = 900 - FEE$$

$$FEE = 900 - 225 = 675.$$

What you should learn from this exercise: first of all of course the difference between the total and the marginal value. Marginal value is the maximum a consumer will give up for an **additional** unit on top of the quantity he already has. Total value measures how much consumer values **all** units consumed, and is equal to the maximum he will pay to purchase those units. Notice that in both cases value refers to personal preferences, different people will value the same things differently and respectively will have different willingness to pay for the same things.

Consumer surplus measures the benefits that consumer gets from shopping. It is calculated as the value the consumer attaches to the purchase (the TV) net of the money spent. Expenditure can take many forms: unit price like in part (b), unit price and a membership fee (d), a fixed payment for a fixed quantity (a). When Mary compares any two deals she does not care whether quantity is fixed or not, she does not care whether unit price is higher or lower, she does not care whether she will consume less or more units, she only cares which deal will give her larger consumer surplus.

4. Do problem 16 from Chapter 5. For full marks also do the following: in part (b) determine whether X and Y are substitute goods; in part (c) determine whether X is a normal or an inferior good. *If you had troubles with calculating arc elasticities please see previous assignments for more practice with answers.*