Practice Set 1 - KEY

Basics & Prerequisites

This set contains problems for your own practice. It is highly recommended to work on the problems on your own. Do not just read the provided solutions. Instead, try to solve the problems and use the solutions only when you cannot continue on your own. Reading problems that someone else has solved has the same value for your preparation like watching someone else running a marathon on TV and then expecting to be able to run it, too. If you have questions on this set, please ask your section's teaching assistant.

1. The following table contains information for the qualifications, sex and annual wage of 4 particular employees.

	Degree	*Languages*	*Sex*	*Annual Wage*
Kate	Bachelor	English, Mandarin	F	$90K
Emma	Master's	English	F	$110K
Olivia	Master's	English, Mandarin	F	$140K
David	Ph.D.	English	M	$170K

(a) Can you tell what is the effect of obtaining a Master's on *annual wage*?

In this dataset, we can only compare Olivia and Kate for who all variables are equal except for their degrees. Olivia holds a Master's and makes annually $50K more than Kate. Since both are women and speak English and Mandarin, we can infer that the difference in wage is due to Olivia's degree.

(b) Can you tell what is the effect of *speaking Mandarin* on *annual wage*?

In our dataset, we can only compare Emma and Olivia for who all variables are equal except for their competence in Mandarin. Olivia earns annually $30K more than Emma, who speaks only English, while everything else is equal for the two women. Therefore, we can infer that speaking Mandarin leads to a higher wage, ceteris paribus.

(c) Can you tell what is the effect of each individual's *sex* on *annual wage*?

The only male in our dataset is David but he cannot be compared to any female from the dataset because he has a Ph.D. degree, while the women in the dataset do not. If we compare David with Emma, for instance, we will not know if the difference in salary is because of the different degree or because David is male. The ceteris paribus principle cannot be applied here.

2. Nancy is a personal trainer. At the market price of $40 per hour she can find plenty of clients. Nancy also owns video equipment and once a month she films a YouTube video for her channel "Pilates with Nancy". It takes Nancy around 6 hours to produce a video on her own from start to finish. On average, each of her videos brings her $500 of ad revenue. If Nancy was not producing videos, she could rent out her equipment for $150 per month.

(a) How much is the accounting cost of a video?

For each video, Nancy does not pay any explicit costs. She produces the entire thing using equipment she already owns. Thus, her accounting cost per video is 0.

(b) How much is the economic cost of a video?

Nancy's work for a video is 6 hours and each hour is valued $40 (because she could indeed make this money per hour if she was doing personal training). Her total cost of work is 6·$40 = $240 per video. Nancy also uses equipment valued at $150 per month. Her total cost of equipment is $150 per video

because she makes 1 video per month. Therefore, the total economic cost of a video is $240 + $150 = $390.

(c) How much is Nancy's accounting profit from a video and what information does this value provide to you?

Accounting profit = Revenue – accounting cost = $500 - $0 = $500. It means that Nancy brings home $500 per video.

(d) How much is Nancy's economic profit from a video and what information does this value provide to you?

Economic profit = Revenue – all costs = $500 - $390 = $110. It means that by producing a video, Nancy makes $110 more than her next best alternative (personal training for 6 hours and renting out her video equipment for a month).

(e) How much is Nancy's economic profit from a video if there is a significant increase in the demand for personal training in the area and its market price increases to $65 per hour?

The economic cost of a video changes because the value of Nancy's work time has increased. The economic cost of a video is now 6·$65 + $150 = $540. The economic profit from a video is $500 - $540 = -$40. This means that Nancy still earns $500 per video but now she would be making $40 more had she done personal training and rented out her equipment instead.

3. The following table shows the total utility (U) I receive from eating cheesecake.

Slices	0	1	2	3	4
U	5	15	24	24	12

(a) Why could I receive 5 units of utility if I have no cheesecake?

There could be many possible reasons. Perhaps, by not having any cheesecake, I could brag about taking care of my silhouette, or my health, which is something that gives me 5 units of satisfaction. Zero consumption is not necessarily associated with zero utility.

(b) Calculate the average utility (AU) for each slice by dividing total utility by the number of slices. Calculate the marginal utility (MU) by calculating the contribution of each slice to total utility.

Slices	0	1	2	3	4
U	5	15	24	24	12
AU	-	15	12	8	3
MU	-	10	9	0	-12

Average utility is just the average of utility with respect to the slices. Marginal utility is how much each slice affects the total. In order to calculate MU*, we subtract the total utility from that unit minus the total utility from the unit before. That is 15 – 5 = 10, 24 – 15 = 9, etc. Neither AU, nor MU can be calculated for zero units.*

4. Consider the equations for the lines $y = 10 + 3x$ and $y = 100 - 2x$. Find x and y at the intersection of the two lines.

Both left-hand-sides of the equations are equal to y, thus we can write: $10 + 3x = 100 - 2x$ or $3x + 2x = 100 - 10$ or $5x = 90$ or $x = 90/5$ or $x = 18$. Then, we can plug $x = 18$ to either line: $y = 10 + 3x$ or $y = 10 + 3 \cdot 18$ or $y = 64$.

You are kindly requested to report any *typos, mistakes* or *proposals* for the improvement of this practice set key at kmarinakis@smu.edu.sg.