Exercise Session 3 (PS2 Solutions)

Principles of Economics I

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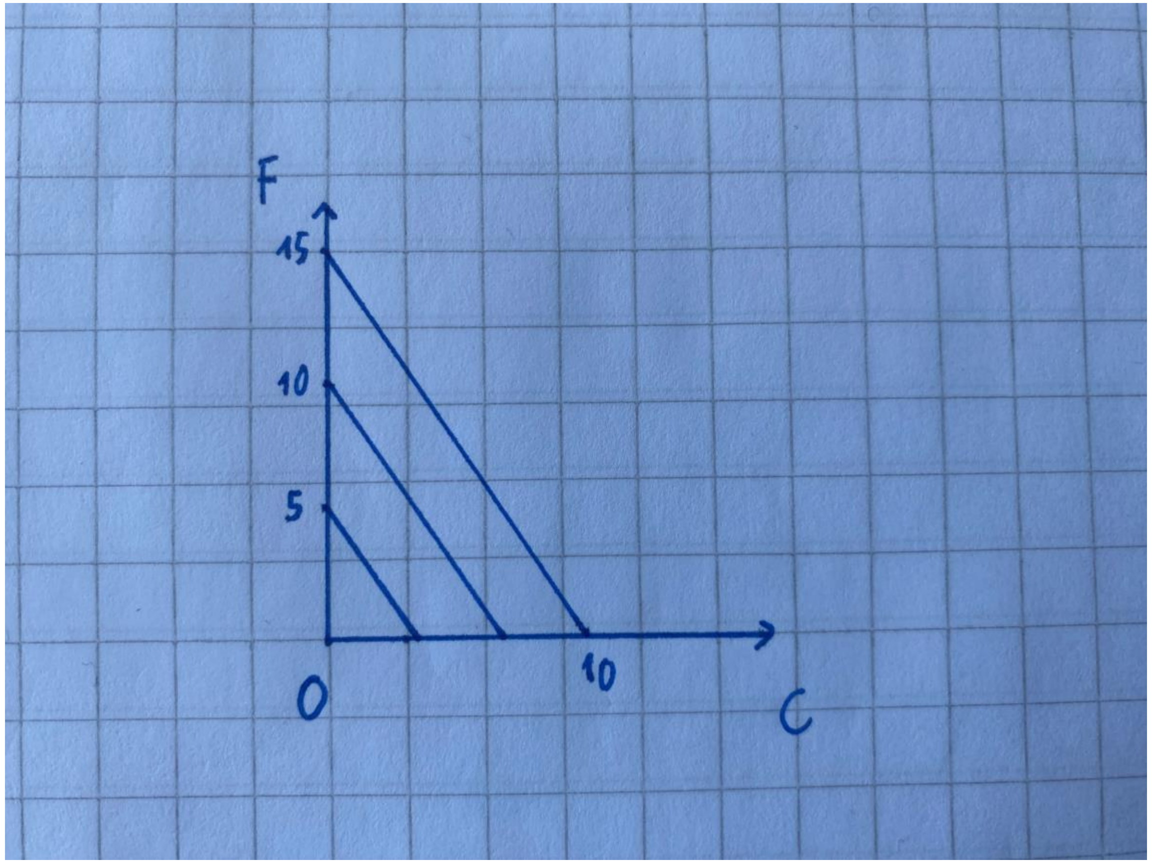
Q1a

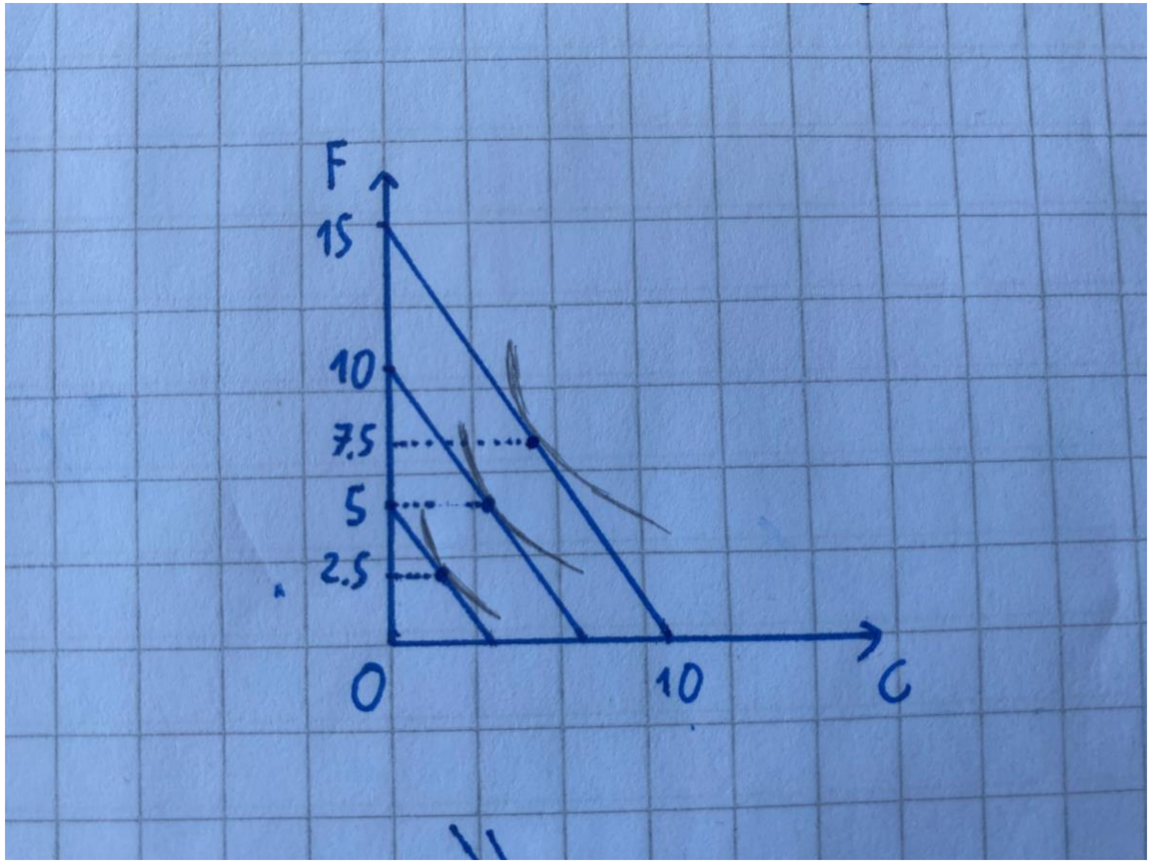


Q1b

Optimal choice

- Budget 100: 5/2 food, 5/3 clothing
- Budget 200: 5 food, 10/3 clothing
- Budget 300: 15/2, 15/3 clothing

Q1b



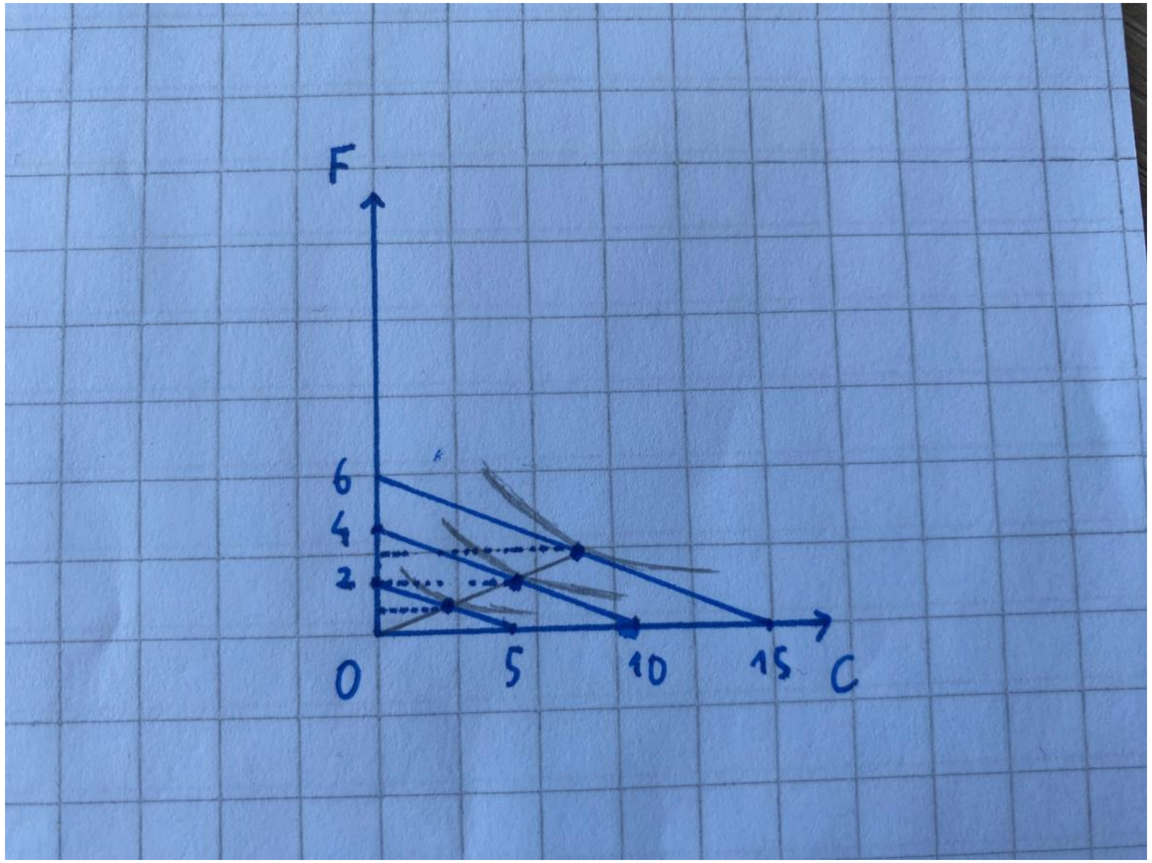
Q1c

Optimal choice

- Budget 100: 1 food, 5/2 clothing
- Budget 200: 2 food, 5 clothing
- Budget 300: 3, 15/2 clothing

The optimal points and the origin are on the same line.

Q1c



Q2a

CPI for the highest earning quintile:

28%*120 + 8%*110 + 64%*105 = 109.6

CPI for the lowest earning quintile:

40%*120 + 12%*110 + 48%*105 = 111.6

Q2b

- Relatively speaking, housing got more expensive and other consumption got cheaper. Therefore, households should allocate their budget share less on housing and more on other consumption. Budget share on food consumption increases or decreases depending on utility function.
- Some concrete ways to adjust consumption (for example in 2022-2023 winter)
  - reduce heating, economize on cheap hours of electricity
  - substitute to cheaper food brands, from meat to vegetables
  - spend less on eating out, recreational activities
  - working at home to reduce transportation costs
  - in the long run, reduce the size of housing

Q2b

- Extra: The absolute amount of housing consumption reduces. The absolute amount of food consumption and other consumption is undetermined.

  (The absolute amount of other consumption might increase/decrease depending on the utility function. The higher budget share spent on other consumption could still result in a lower absolute amount of other consumption because of increasing prices of all goods.)

- Extra: In the short-run, it is difficult to reduce consumption on housing, households might need to reduce food consumption and other consumption.

Q3a

We cannot say with certainty what will happen. It depends on Ann's preferences (shape of her indifference curve).

Ann might want to increase her free time because now she can earn the same amount of money by working less (income effect); on the other hand, as the opportunity cost of her free time has gone up, she might want to work more as a result of the wage increase (substitution effect). The net effect depends on the relative size of the two effects.

Q3b

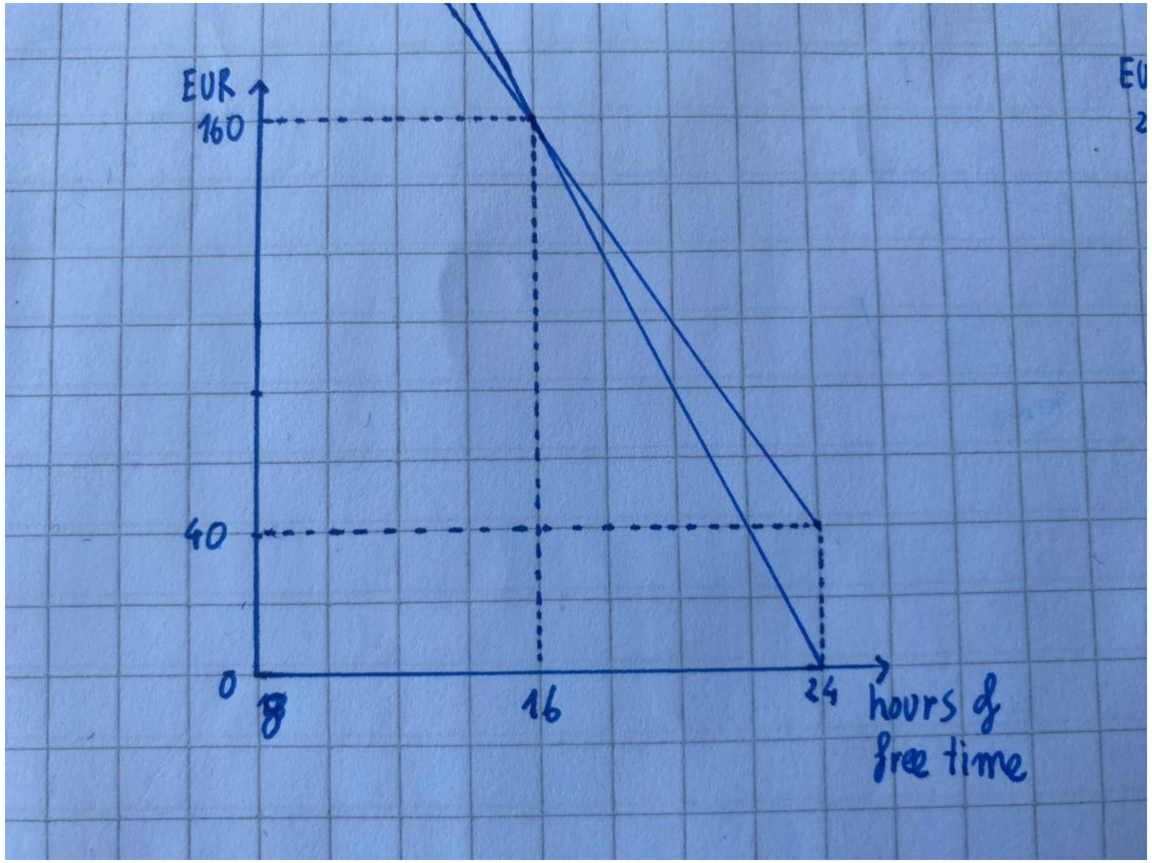
See that the x axis is the number of “hours of free time” rather than “hours of work”. We get the “regular” downward-sloping budget constraint that is easier to interpret. It is acceptable to plot with “hours of work”, but the graphs would look different.

OLD WAGE: 15€/hour x 8 hours/day = 120€/day

WITH RAISE: 20€/hour x 8 hours/day = 160€/day

NEW PROPOSAL: 40€/day + 15€/hour x 8 hours/day = 160€/day

Q3b



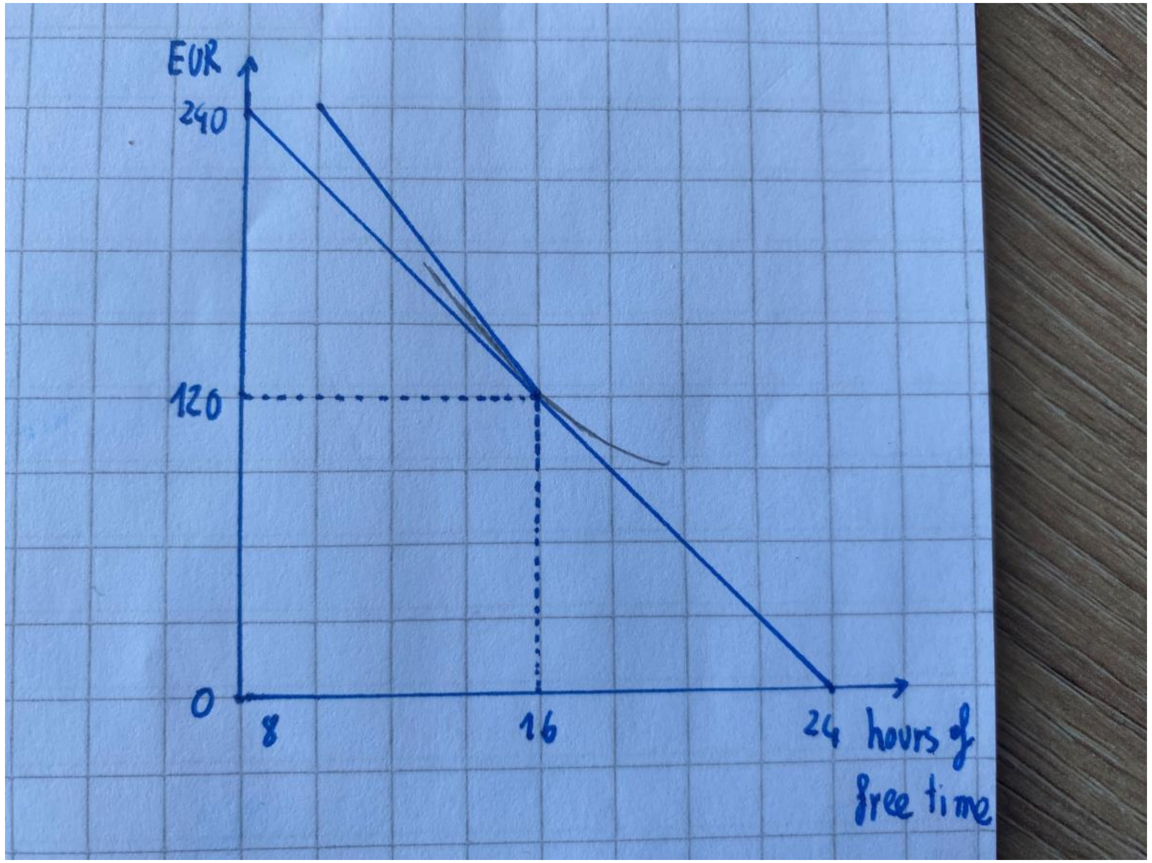
Q3c

We can check the amount of euros she gets at each level of free time. For any working hours below 8, she is better off under her proposal and for working hours above 8, she is worse off under her proposal.

Q3d

It depends on Ann’s preferences (the shape of her indifference curves). At the point of working 8 hours, if one extra hour of free time is worth less than 25 hours, she would work more than 8 hours (as in the example with the indifference curve in the graph, Ann would choose to work more than 8 hours).

Q3d



Q4a

Customer: No dominant strategy

Cook: Dominant strategy is “Low”

Nash equilibrium: (Low, No Buy)

Here we are assuming that the ingredient goes to waste if the customer does not buy the meal from the cook.

		Customer	
		No Buy	Buy
Cook	Low	**-10, 0**	**20**, -10
	High	-15, 0	15, **10**

Q4a

Alternative payoffs assuming that the cook does not lose anything if the customer does not buy the meal. The answer is still the same.

Customer: No dominant strategy

Cook: Dominant strategy is "Low"

Nash equilibrium: (Low, No Buy)

		Customer	
		No Buy	Buy
Cook	Low	**0**, **0**	**20**, -10
	High	**0**, 0	15, **10**

Q4b

Suggested answer: A meal from inferior ingredients is worth EUR 35 to the customer.

Customer: Dominant strategy is “Buy”

Cook: Dominant strategy is “Low”

Nash equilibrium: (Low, Buy)

		Customer	
		No Buy	Buy
Cook	Low	**-10**, 0	**20**, **5**
	High	-15, 0	15, **10**

Q4c

Compared with the Nash equilibrium (Low, No Buy), the outcome (High, Buy) gives both sides a higher payoff.

However, it is difficult for the cook to convince the consumer that he always buys high-quality ingredients.

At the same time, if the consumer convinces the cook that he always buys the meal, it gives the cook incentives to buy low-quality ingredients.

		Customer	
		No Buy	Buy
Cook	Low	**-10**, **0**	**20**, -10
	High	-15, 0	15, **10**

Q4c

The reviews of customers, or the decisions of repeated customers act as signals and punishment mechanism in this game.

If the cook gives credible signal that he buys high-quality ingredients from past reviews, the consumer will choose to buy the meal.

If the consumer receives a bad-quality meal, he can punish the cook by bad reviews or by not returning. This would provide incentives for the cook to not deviate to low-quality ingredients. The cook partly scarifies current profits for future profits.

		Customer	
		No Buy	Buy
Cook	Low	**-10**, **0**	**20**, -10
	High	-15, 0	15, **10**

Q5a

There are no dominant strategies, as it will always depend on the demand of the other player.

Any split that sums up to 1 is a Nash Equilibrium. If both players are already getting the amount demanded and the two amounts sum up to 1, any deviation from the current demand of one player will result in a lower payoff to that player: by increasing the demand, the payoff will go to 0 (as the sum of the two demands would exceed 1); by decreasing the demand, the payoff will be lower than before.

Q5b

Ann should offer two equal pieces to Bob, so to constrict his choice, and to guarantee that she gets 1/2. If she divides in any other way, Bob will pick the larger piece, and she will end up with less than ½.

Q5c

Ann should cut a piece that has the maximum amount of almonds with at most 49 raisins. By doing so, she makes sure that Bob will choose the other piece with 51 raisins, and leave her the piece with maximum amount of almonds.

Q5d

If Ann does not know whether Bob likes almonds or raisins, she should cut the cake into 2 pieces having 50 almonds each. It is guaranteed that she gets 50 almonds.

Alternative answer: If we assume Bob likes almond with probability of 50% and Ann is risk-neutral or risk-loving, Ann should cut the cake in 2 haves, one with more than 50 almonds and one with more than 50 raisins.