Microeconomics Problem Set

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1 消费者

1.1 布兰科·伊万科维奇

对于以下每个陈述，请判断其为"正确"或"错误"，并说明理由。

伊万是某大国国家队的足球教练。他根据三个标准评估球员：身高、力量和速度。如果一名球员在至少两个标准上优于另一名球员，伊万会更偏好这名球员。假设没有两名球员的身高、力量或速度完全相同。

(a) 伊万的偏好是完备的。

(b) 伊万的偏好是符合传递性的。

Evankovic is a football coach. He evaluates his players based on three criteria: height, strength, and speed. Evankovic prefers one player over another if he is better in at least two of these criteria. Assume that there are no players with the exact same height, nor the exact same strength, nor the exact same speed.

(a) Evan's preferences are complete.

(b) Evan's preferences are transitive.

1.2 比例税和人头税

假设你同时购买苹果和橙子。

(a) 如果有两种征税方案，一种是只对苹果征收销售税，另一种是对每个人征收人头税（无论购买什么商品均需支付固定金额的税款）。假设在两种方案下，你需要支付的总税额是相同的，你会更倾向于哪种方案？

(b) 如果有两种征税方案，一种是只对苹果征收销售税，另一种是对苹果和橙子同时征收销售税，使两种商品的价格都上涨 10%。假设在两种方案下，你需要支付的总税额是相同的，你会更倾向于哪种方案？请你做一个直觉解释为何会如此。

Suppose you buy both apples and oranges.

(a) There are two taxation schemes: one imposes a sales tax on apples only, while the other imposes a head tax (a fixed amount of tax paid by every individual regardless of what they purchase). Assuming that your total tax bill is the same under both schemes, which one would you prefer?

(b) There are two taxation schemes: one imposes a sales tax on apples only, while the other imposes sales taxes on both apples and oranges, causing the prices of both goods to increase by 10%. Assuming that your total tax bill is the same under both schemes, which one would you prefer? Provide an intuitive explanation.

1.3 张三

张三的效用函数关于食物 (f) 和衣服 (c) 的形式为 $U(f,c) = (f^\alpha + c^\alpha)^{\frac{1}{\alpha}}$，其中 $\alpha > 0$。张三关于两种商品的边际替代率（MRS）为何？张三的效用函数总是满足边际替代率递减吗？

Zhang San's utility function for food (f) and clothes (c) is given by $U(f,c) = (f^\alpha + c^\alpha)^{\frac{1}{\alpha}}$, with $\alpha > 0$. What is Zhang San's MRS? Does Zhang San's preferences satisfy the principle of diminishing marginal rate of substitution for any value of α?

1.4 奶茶

我们有以下关于中国某大学城内奶茶需求的每周数据，同时也有该时间段内保温杯价格的数据：

保温杯价格（元）	奶茶价格（元/杯）	奶茶需求数量（杯）
300	10	100
310	10	95
320	10	90
300	11	99
310	9	96

1. 假设我们知道奶茶的需求函数形式如下：

$$Q^D_{奶茶} = \alpha + \beta_{奶茶}P_{奶茶} + \beta_{杯子}P_{杯子}$$

请根据我们的数据，求出其具体形式。

2. 你在第（1）部分中找到的需求函数是否满足需求法则？请解释。

3. 在这个大学城内，奶茶的供给曲线为：

$$Q^S_{奶茶} = 2P_{奶茶}$$

求出均衡价格和均衡交易数量，并用 $P_{杯子}$ 表示它们。均衡价格和均衡数量如何取决于 $P_{杯子}$？请简要说明直觉。

We have the following weekly demand data for milk tea in a Chinese university town, along with the price data for thermos cups during the same period:

Price of thermos cups (yuan)	Price of milk tea (yuan/cup)	Quantity of milk tea demanded (cups)
300	10	100
310	10	95
320	10	90
300	11	99
310	9	96

1. Assume that the demand function for milk tea is given as:

$$Q^D_{\text{milk tea}} = \alpha + \beta_{\text{milk tea}} P_{\text{milk tea}} + \beta_{\text{thermos}} P_{\text{thermos}}$$

Based on the data, derive its specific form.

2. Does the demand function you found in part (1) satisfy the law of demand? Explain.

3. In this university town, the supply curve for milk tea is given as:

$$Q^S_{\text{milk tea}} = 2 P_{\text{milk tea}}$$

Solve for the equilibrium price and quantity, expressed in terms of P_{thermos}. How do the equilibrium price and quantity depend on P_{thermos}? Briefly explain the intuition.