

Microeconomics 1 Exam - October 17th, 2022

Erasmus Mundus Joint Master Degree (EMJMD) - QEM1 (First Year) - DU MMEF
2022/2023

Please solve all exercises below. **Motivate all your answers.**
You have **1 hour** to provide your solutions.
The exam is closed book and closed notes.

Exercise 1 (20 minutes)

Consider a consumer with consumption set \mathbb{R}_+^2 and utility function $u(x_1, x_2) = \log(x_1) + \log(x_2)$.

- (a) Justify that the preferences of the consumer can equivalently be represented by the utility function $v(x_1, x_2) = \sqrt{x_1 x_2}$.
- (b) Represent graphically the indifference curve and the upper contour set of the consumer for the utility level 1.
- (c) Determine the demand function of the consumer for a price $(p_1, p_2) > 0$ and an income $w > 0$.

Exercise 2 (40 minutes)

Consider an expected-utility decision maker with utility of the form $u(x) = x^2$.

- (a) Let X be a lottery with equally likely outcomes $(0, 2, 4, 8)$. Determine $\mathbb{E}(u(X))$.
- (b) Let Y_π be a lottery whose outcome is 3 with probability π and 9 with probability $1 - \pi$. Determine the value π^* for which the decision maker is indifferent between X and Y_{π^*} .
- (c) If $\pi > \pi^*$ which lottery between X and Y_π is preferred by the decision maker? Why?
- (d) Assume that a third lottery is available, lottery Z with equally likely outcomes $(27, 37, 77)$, and that the decision maker can choose between the combinations $\frac{1}{2}X + \frac{1}{2}Z$ and $\frac{1}{2}Y_{\pi^*} + \frac{1}{2}Z$. Which combination is preferred? Why? (no computation is needed)
- (e) Compute the absolute risk aversion of the decision maker.
- (f) Is this decision-maker risk-averse, risk-neutral, risk-loving?