



**Stockholm
University**

Department of Economics

Course name: Intermediate microeconomics
Course code: EC2101
Type of exam: Main
Examiner: Adam Jacobsson
Number of credits: 7,5
Date of exam: 200223
Examination time: 09.00-14.00
Aids: No aids are allowed.

Write your identification number on each answer sheet (the number stated in the upper right hand corner on your exam cover).

Start each new question on a new answer sheet.

Explain notions/concepts and symbols. If you think that a question is vaguely formulated, specify the conditions used for solving it. Only legible exams will be marked.

The exam consists of 5 questions. Questions 1-3 are worth 25 points each, question 4 is worth 15 points and question 5 is worth 10 points. 100 points in total. For the grade E 45 points are required, for D 50 points, C 60 points, B 75 points and A 90 points. If you have the course credit you do not answer question 5.

Your results will be made available on your Ladok account (www.student.ladok.se) within 15 working days from the date of the examination.

Good luck!



Question 1

Ragnar can consume two goods, good 1 and good 2 where x_1 and x_2 denote the quantity consumed of each good. These goods sell at prices p_1 and p_2 , respectively. Ragnar's preferences are represented by the following utility function: $u(x_1, x_2) = 2x_1x_2^2$. Ragnar has an income of m .

- Derive Ragnar's Marshallian demand functions for the two goods. (10 points)
- Are the two goods ordinary goods? Explain using maths! (4 points)
- Calculate Ragnar's price elasticities for goods 1 and 2. Explain also in words what the measure means. (4 points)
- Would the utility function $u(x_1, x_2) = \sqrt{2x_1x_2^2}$ still represent Ragnar's preferences? Motivate your answer! (4 points)
- Are Ragnar's marginal rates of substitution the same for both of the above utility functions? Explain! (3 points)

Question 2

A Viking village, Kattegat, has a nearby forest that they use for hunting. The Vikings can send out a number, v , of Vikings into the forest to hunt for wild boar. The cost of sending one Viking into the forest hunting is 2 SEK (the Viking could have knitted a scarf that would have sold for 2 SEK had he/she not gone hunting). One wild boar can be sold for a market price of 2 SEK (a constant price). Total wild boar production is given by: $f(v) = 10\sqrt{v}$. The Viking queen Lagerda runs the village with absolute authority and decides how many Vikings to send hunting.

- How many Vikings does Lagerda send hunting? (7 points)
- How large are total profits? (3 points)

Sadly, Lagerda's stepson one night eats some very bad mushrooms and accidentally stabs Lagerda, leaving the village without a strong leader. Suddenly all the Vikings now decide individually whether to go hunting or not.

- How many Vikings will now go hunting? (7 points)
- How large are total profits now? (3 points)
- Compare your answers in a) and b) to your answers in c) and d) and explain the differences, if any. (5 points)

Question 3

Ubbe owns a house that burns down with probability π (in the other possible state of the world the house does not burn down). If the house burns down Ubbe's wealth is reduced from 3600 to 400 SEK. Ubbe's utility from wealth in each state of the world $i \in \{1,2\}$ is $u_i = \sqrt{c_i}$ where c_i is the wealth in state i .

- Assuming $\pi = 0,5$ what is Ubbe's expected wealth? (5 points)
- For the same probabilities, what is Ubbe's expected utility? (5 points)

Since Lagerda's death Ubbe has a creepy feeling that the gods are against him so he starts to think about the horrible prospect of variance in wealth. Floke then shows up and suggests a clever invention. Floke has noticed that many Vikings have started worrying about losses but it seems that not everyone experiences losses at the same time. Floke has thus started the Viking insurance company, "Loke's arrow", that offers to pay out K SEK if the insuree pays Floke $\frac{3}{5}K$ SEK in insurance premium. Everybody agrees the risk of a loss is 0,5.

- Ubbe thanks Floke (and the gods) and then buys insurance from Floke. How much will Ubbe buy? (10 points)
- What would the actuarially fair price of insurance be? Explain what that is. If Floke's price of insurance would be actuarial (if it already is not), how much insurance would Ubbe then buy? (5 points)

Question 4

A monopolist faces two totally separated markets, A and B, with inverse demand functions $p_A = 50 - 2q_A$ and $p_B = 74 - 4q_B$ respectively (that is, the monopolist sells the same good in two different markets). The monopolist has a cost function given by $C(q) = 2q$ where $q = q_A + q_B$. Find the profit maximizing total output and how much is sold on market A and market B respectively if the monopoly uses third degree price discrimination. What prices will our monopolist charge in the two separate markets?

(10p)

- Calculate the price elasticity of demand in each market (at the optimal quantities and prices) and explain the intuition behind the relationship between the prices and elasticities in these two separate markets. (5p)

Question 5

If you have the course credit, do not answer this question.

Ragnar and his son one day decide to play a game. They have to decide on their strategies simultaneously without knowing the other player's choice. The payoffs are indicated in the matrix below with Ragnar's payoff written first, followed by Ivar's payoff in each cell.

- a) What Nash equilibria can you find by using pure or mixed strategies in this game?
(5 points)

		Ivar	
		Left	Right
Ragnar	Top	3, 2	0, 3
	Bottom	2, 3	1, 2

- b) Now assume that Ragnar gets to move first and Ivar then observes Ragnar's choice and then moves. Illustrate the new game in a game tree and find the sub game perfect Nash equilibrium/a.
(5 points)