73115

ALGEBRA I examination **September 2005**

General instructions

Use of books and notes allowed.
Provide concise answers with short and precise justification.
Write your family name on every page you hand in,
number consecutively all pages that you hand in,
write on the first page the number of pages that you hand in.
No page should contain answers or fragments of answers to more than one question.

Questions:

1. Describe two non-isomorphic 8-element groups. without using multiplication tables.

2. Describe some differences between the additive and the multiplicative semigroup structures of the integers.

3. Give an example of a finite monoid that is not isomorphic to a subgroup of any group.

4. Give an example of a 4-element ring which has 4 different ideals, and describe all these ideals explicitly.

5. What is the number of polynomials of degree two over a three-element ring?