

73115

ALGEBRA 1 examination



December 2003

General instructions:

Use of books and notes allowed.

Use of electronic devices such as calculators or computers not allowed.

Provide justified but concise answers.

Write your family name on every non-empty page you hand in,

number consecutively all non-empty pages you hand in,

write the total number of non-empty pages handed in on the first page.

No page should contain answers or fragments of answers to more than one question.

Questions:

Let  $G$  be a 12-element cyclic group. How many quotient groups does it have ?

Give an example of a non-principal ideal.

What is algebra ?

Give two different examples of finite semigroups that are not groups.

Describe all those polynomials of degree 4 over a 2-element field which have 0 as a root.