

Math 546 Summer 2001 Exam 1 (11)

PRINT Your Name: _____

There are 9 problems on 6 pages. Problems 1-5 are worth 6 points each. Each of the other problems is worth 5 points.

1. Define "group". Use complete sentences.

A group is a set G together with an operation $*$ which satisfies the following properties

Closure If x and y are in G , then $x*y$ is in G .

Associativity If $x, y,$ and z are in G , then $(x*y)*z = x*(y*z)$

Identity There exists an element of G , called e , with

$e*x = x$ and $x*e = x$ for all $x \in G$.

Inverses If x is in G , then there exists an element $x^{-1} \in G$ with

$x*x^{-1} = e$ and $x^{-1}*x = e$

2. Define "subgroup". Use complete sentences.

Let $(G, *)$ be a group. The subset H of G is a subgroup of $(G, *)$ if $(H, *)$ is a group under the same operation $*$.