

546 Exam 1 Summer 2002

PRINT Your Name: _____

There are 8 problems on 5 pages. Problems 1 and 2 are worth 7 points each. Each of the other problems is worth 6 points.

1. Define "group". Use complete sentences.

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

(Closure) If a and b are in G , then $a * b \in G$.

(Associativity) If a, b, c are in G , then $(a * b) * c = a * (b * c)$

(Identity element) There exists an element id in G such that
 $a * id = a$ and $id * a = a$ for all a in G .

(Inverses) For each $a \in G$, there is an element b in G
with $a * b = id$ and $b * a = id$

2. Define "subgroup". Use complete sentences.

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