546 Final SI 2001 (7)

PRINT Your Name:_____

There are 8 problems on 4 pages. Problems 1–4 are worth 13 points each. Each of the other problems is worth 12 points.

1. Define "Group".

A Group is a set G together with an operation $*$ which satisfies

Closure: If $a, b \in G$, then $a * b \in G$

Associativity: If $a, b, c \in G$, then $(a * b) * c = a * (b * c)$.

Identity: There is an element $e \in G$ with $a * e = a$ and $e * a = a$ for all $a \in G$

Inverses: If $a \in G$ then there exists an element $b \in G$ with $a * b = e$ and $b * a = e$

2. Define "subgroup".

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