

PRINT Your Name: _____

There are 7 problems on 3 pages. The exam is worth a total of 50 points. Problem 3 is worth 8 points. The other problems are worth 7 points each.

1. DEFINE *normal subgroup*.

The subgroup N of the group G is normal if $gNg^{-1} = N$
for all $g \in G$.

2. DEFINE *kernel*. The kernel of the group homomorphism $\phi: G \rightarrow G'$ is equal to the set of all elements g of G such that $\phi(g)$ is equal to the identity element of G' .

3. STATE Lagrange's theorem. If H is a subgroup of the ^{finite} group G , then the order of H divides the order of G .