Algebra - hw # 5

fall 2008

About the "uniqueness" issue ...

1. Problem 3.b The novelty here was to prove that the group was inded *unique* (up to isomoprhism, always).

2. Problem 3.b

When you talk about a semidirect product $A \rtimes B$ you are implicitely referring to some map $A \rtimes_{\psi} B$. So when they ask you show that some group is the *unique* one with structure given by some semidirect product, you must show, for instance, that any choice of morphism ψ will give you the same group (up to isomorphism, always).

Simple groups

In problem (3.d) you are asked to show that G cannot be simlpe. Most of you happily said that since it has already been proved that it has a normal subgroup of index 2 then it cannot be simple. Well this is nice, but take a minute, breath, and consider the situation. Are you sure there is no exception, no extreme pathological case? And just so you don't spend more time than it would be adequate on this, let me tell ya that $Z/2$ does NOT have a propper normal subgroup, therefore it IS a simple group.