Some extra problems for Math 4107

January 30, 2008

Here are some problems for your homework, which I have been implicitly using in class, but which I should have perhaps gone through in detail in the lectures. For these problems, fix a group $G$, and suppose that $A, B, C \leq G$.

1. Show that for every $x \in G$ and $a \in A$,
   
   $x A a = x A$.

2. Show that
   
   $x A A = x A$.

3. Show that if
   
   $A B = A$,

   then
   
   $B \subseteq A$.

4. Show that
   
   $A B = A C \implies B \subseteq A C$, and $C \subseteq A B$.

   (As an exercise not to be turned in, show that one does not always have that $B = C$ – i.e. you cannot always cancel the $A$.)