

Optional Bonus Problems (Worth 1 Homework Point Each):

Turn in your solution to any of the problems below by 11/08/2013. To receive credit for a problem, your work must be completely flawless.

In other words, *all or nothing*.

Please work individually on these, and do not seek help from any sources other than me.

- (1) Let G be a group, let $H \trianglelefteq G$, and suppose furthermore that H is cyclic. Show that any subgroup of H is a normal subgroup of G . Give a counterexample that shows this statement may be false if H is not cyclic.
- (2) Let G be a group, let H and K be subgroups of G . Suppose further that $K \trianglelefteq G$. Show that $K \cap H \trianglelefteq H$.