Homework #5

HW due Sunday 2/23 by pdf upload to Canvas; .tex source on the MATH 312 github repo.

Stuff from class slides that I promised would be on the homework

Problem 1. Prove that $N_G(H) \leq G$.

Problem 2. Prove that $H \trianglelefteq N_G(H)$. (So, first prove that H is a subgroup of its normalizer, and then prove that it's a *normal* subgroup of its normalizer.)

Problem 3. Let $H \leq G$. Prove that if $ghg^{-1} \in H$ for all $h \in H$ and $g \in G$, then $gHg^{-1} = H$ for all $g \in G$.

Problem 4. Let $H \leq G$ and $g \in G$. Prove that the conjugate, gHg^{-1}, is a subgroup of G.