1. Determine all of the homomorphisms from Z_{20} to itself. For each homomorphism, determine its kernel.
2. Prove that if $H \trianglelefteq G$ and $K \trianglelefteq G$ and $H \cap K = \{e\}$, then G is isomorphic to a subgroup of $G/H \oplus G/K$.
3. Prove that if G and H are finite groups and $|G|$ and $|H|$ are relatively prime, for any homomorphism $\varphi : G \to H$, $\ker \varphi = G$.
4. Determine, with proof, how many nonisomorphic Abelian groups there are of order 360.
5. You are told that a group G is an Abelian group of order 16 and that there are elements a and b of G which both have order 4, and for which $a^2 \neq b^2$. Which isomorphism classes could contain this group?

due Thurssday, November 21, 2014