MTH 361
Quiz 8
Spring 2010

20 points possible.

1. (5 pts.) Let $\phi : \mathbb{Z}_{10} \to \mathbb{Z}_{20}$ be the group homomorphism such that $\phi(1) = 16$. Find $\text{Ker}(\phi)$ and $\phi(7)$.

2. (5 pts.) Let $\phi : \mathbb{Z} \to S_8$ be the group homomorphism such that $\phi(1) = (1\ 3\ 8)(2\ 6)$. Find $\text{Ker}(\phi)$ and $\phi(5)$.

3. (5 pts.) Let $\phi : \mathbb{R} \to \mathbb{Z}$, where $\mathbb{R}$ and $\mathbb{Z}$ are both additive groups, be given by $\phi(x) = \lceil x \rceil$, the ceiling of x (i.e., that unique integer n such that $n - 1 < x \leq n$). Determine whether or not ϕ is a homomorphism. If so, prove it. If not, disprove it by showing a counterexample.

4. (5 pts.) Let $\phi : G \to G'$ be a group homomorphism, and let $H \leq G$. Prove $\phi[H] \leq G'$.