Math 113 Homework # 2, due 9/16/9 at 2:10 PM

1. Fraleigh section 3, exercises 2, 4, 6, 8, 10, 26, 27, 30.
2. Fraleigh section 4, exercises 9, 10, 19, 28.
3. Let $n > 1$ be an integer and let $\mathbb{Z}_n^*$ be the set of *units* in $\mathbb{Z}_n$, i.e. elements $x \in \mathbb{Z}_n$ such that there exists $y \in \mathbb{Z}_n$ with $xy = 1$.
   (a) Show that $\mathbb{Z}_n^*$ (with the operation of multiplication) is a group.
   (b) Make multiplication tables for $\mathbb{Z}_8^*$, $\mathbb{Z}_{10}^*$, and $\mathbb{Z}_{12}^*$.
   (c) Show that $\mathbb{Z}_8^* \simeq \mathbb{Z}_{12}^*$ but $\mathbb{Z}_8^* \not\simeq \mathbb{Z}_{10}^*$ and $Z_{10}^* \not\simeq \mathbb{Z}_{12}^*$.
4. How challenging did you find this assignment? How long did it take?