HW #6, due October 10th

Chapter 5: 44, 50

Chapter 6: 1, 4, 5, 8, 18, 19, 20, 25, 37

Extra Problems for HW #6

**Problem 1:** Let $G$ be a group and let $g$ be an element of $G$. Show that for every $x \in G$, $|xgx^{-1}| = |g|$.

**Problem 2:** Let $P$ be the group of all polynomials in $x$ with coefficients in $\mathbb{Z}$ under addition, and let $Q$ be the group of all positive rational numbers under multiplication. Prove that $P \approx Q$.

*(Hint: Let $p_0 = 2$, $p_1 = 3$, $p_2 = 5$, . . . , and in general, let $p_n$ be the $n + 1$st prime in the list of primes, and consider the mapping $a_n \cdot x^n \mapsto p_n a_n$.)*