Math 568 Problem Set #8 Due 11/10/14

1 - 5: problems 1-5 on p. 57-58. (Note: I will prove a few simple facts about cyclotomic fields on Wednesday that you may need for these. Also note that for 1, you might try proving a multiplicative version of Mobius inversion, which follows easily from the usual additive version.)

6. Let A be a domain with field of fractions K, let L be a finite extension of K, and let B' be an integral extension of A such that L is the field of fractions of B'. Show that for any $x \in L$, there is a nonzero $a \in A$ such that $ax \in B'$.

7. Find the integral closure of $\mathbb{Z}$ in $\mathbb{Q}(\sqrt[3]{19})$.