Assignment 2
(Due Thursday, January 27, 2005)

Reading: §1.3, A.3, Problem 38, §1.3

Problems: §1.2: #1, 2, 3, 4, 6, 16b
§A.3: #1, 3, 4

Additional Problems: 1. Prove:
   a. If $a, b \in \mathbb{Z}$ and $a|b$, then $|a| \leq |b|$.
   b. If $a, b, c \in \mathbb{Z}$, $c|b$ and $b|a$, then $c|a$.

2. Let $a \in \mathbb{Z}$ and let $D(a)$ be the set of divisors of $a$. Let $a = bq + r$, where $b, q, r \in \mathbb{Z}$. Prove that $D(a) \cap D(b) = D(r) \cap D(b)$.

3. Let $a, b \in \mathbb{Z}$ and let
   $$L(a, b) = \{ma + nb \mid m, n \in \mathbb{Z}\},$$
   the set of linear combinations of $a$ and $b$. Let $a = bq + r$, where $q, r \in \mathbb{Z}$. Prove that
   $$L(a, b) = L(r, b).$$

4. Challenge problem: §1.2, #19 (You may assume $(a, b) = 1$.)