

Problem Set 1  
Due Friday, October 5.

*Algebra*

Math 110A, Fall Quarter 2012

1. Do problems 1.1.4, 1.1.5, 1.1.7 in the textbook.
2. Do problems 1.2.1 (b), (d), (f), 1.2.13, 1.2.24, 1.2.31, 1.2.34 in the textbook.
3. Recall that integers  $a, b$  are said to be **relatively prime** if their greatest common divisor is 1.
  - (a) Suppose we can write  $1 = sa + tb$  for some  $s, t \in \mathbb{Z}$ . Show that  $a$  and  $b$  are relatively prime.
  - (b) Show: if  $a$  and  $c$  are relatively prime, and  $b$  and  $c$  are relatively prime, then  $ab$  and  $c$  are relatively prime. (Hint: if  $1 = sa + tc = s'b + t'c$  with  $s, t, s', t' \in \mathbb{Z}$ , consider  $(sa + tc)(s'b + t'c)$  and use part (a).)