Number Theory II
Assignment 3.2
FALL 2010
Due September 15

Exercise 1. Let $m$ and $n$ be relatively prime integers. Define $X(a, b)=a b$ and $Y(d)=$ $(\operatorname{gcd}(d, n), \operatorname{gcd}(d, n))$.
a. If $r, s$ and $t$ are integers and $\operatorname{gcd}(r, s)=1$ prove that $\operatorname{gcd}(r s, t)=\operatorname{gcd}(r, t) \cdot \operatorname{gcd}(s, t)$
b. Prove that $X$ and $Y$ provide inverse bijections between then sets $\{a: a \mid m\} \times\{b: b \mid n\}$ and $\{d: d \mid m n\}$.

Exercise 2. Chapter 2, Exercise 3

Exercise 3. Chapter 2, Exercise 27

