

# Discrete Structures. CSCI-150. Fall 2013.

## Homework 7.

Due Wed. Oct 30, 2013.

### Problem 1

Write out, how Euclid's algorithm computes:

(a)  $\gcd(287, 120)$

(b)  $\gcd(192, 33)$

(c)  $\gcd(89, 144)$

### Problem 2

For  $a, b \in \mathbb{Z}$ , prove that if  $a \mid b$  and  $b \mid a$  then  $a = b$  or  $a = -b$ .

### Problem 3

For positive  $a, b \in \mathbb{Z}$ , prove that if  $a \mid b$  and  $a \mid (b + 2)$  then  $a = 1$  or  $a = 2$ .

### Problem 4

For positive  $n \in \mathbb{Z}$ , prove that if  $n$  is odd then  $8 \mid (n^2 - 1)$ .

### Problem 5

For positive  $a, b, c \in \mathbb{Z}$ , prove that if  $c = \gcd(a, b)$  then  $c^2 \mid ab$ .