

Math 255 - Spring 2018  
Homework 3

This homework is due on Monday, February 5.

1. Use the Euclidean Algorithm to compute the following greatest common divisors:

(a)  $(143, 227)$

(b)  $(272, 1479)$ .

2. Prove that the square of any integer is of the form  $3k$  or  $3k + 1$ .

3. Let  $a$  and  $b$  be integers, and suppose that the polynomial  $x^2 + ax + b$  has an integer root  $r$ . Show that  $r$  divides  $b$ .

Hint: You can solve this problem without any theorem we have covered so far.

Extra problem for graduate credit:

4. Let  $n$  be an odd integer. Show that  $n^2 = 1 + 8k$  for some integer  $k$ .