

Math 255 - Spring 2017  
Homework 2

This homework is due on Monday, January 30.

- Use the Division Algorithm to show that the square of any integer is of the form  $3k$  or  $3k + 1$ .
  - Use the Division Algorithm to show that the square of any integer is of the form  $4k$  or  $4k + 1$ .
- Use induction to show that

$$15 \mid (2^{4n} - 1) \quad \text{for } n \geq 1.$$

- Prove that if  $a$  and  $b$  are both odd integers, then  $16 \mid (a^4 + b^4 - 2)$ .