

Math 103A Fall 2005 HW 6

HW Due 11/7/05 in class

All exercise and page numbers refer to Gallian, 6th edition.

0. These exercises are suggestions for extra practice at home (or in section) and are *not to be turned in!*

Gallian Section 7, #17

Gallian Section 8, #9, 11, 15, 17, 23, 25, 27, 33, 35, 41, 57

1. Suppose you do not know if the number 51 is prime or composite. You can use the primality test discussed in class, where some random number $a < 51$ is picked, and you check to see if $a^{51} \bmod 51 = a \bmod 51$.

Suppose one first picks $a = 16$. Calculate $16^{51} \bmod 51$. Use the method of successive squaring as demonstrated in class, to avoid having to calculate too many powers. Is $16^{51} \bmod 51 = 16 \bmod 51$? What can we conclude about 51?

Now pick $a = 2$. Is $2^{51} \bmod 51 = 2 \bmod 51$? What can we conclude about 51 now?

2. Gallian Chapter 7, #16

3. Gallian Chapter 8, #2, 4, 8, 10, 16, 44, 50, 58