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 $a^{51} \mod 51 = a \mod 51$.

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

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

2. Gallian Chapter 7, #16

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