

CS 2800: Discrete Structures

Homework 6

Due Monday, October 15, 2012

Please write your netid on the upper right corner of all pages. Grading for all problems will be based on neatness, style, and correctness.

1. Construct the multiplication table for arithmetic mod 7.
2. (a) if $i \geq 0$ what is $i \pmod{p}$?
(b) if $i < 0$ what is $i \pmod{p}$?
3. What is $800^{35} \pmod{11}$?
4. Compute $3^{586} \pmod{5}$ by repeated squaring.
5. (a) Use Euclid's algorithm to compute the gcd of 495 and 210. Write out the steps.
(b) What is the prime factorization of 495 and of 210?
(c) Is your answer to part (a) correct? Check using your answer to part (b).
6. (Modular arithmetic) Consider $49 \times 103 - 279 = 4768$.
Convert 49, 103, and 279 to a modular representation using the primes 7, 11, 13, and 17. Then do the computation using modular arithmetic multiplying the modular representations of 49 and 103 and subtracting the modular representation of 279 to get the modular representation of the answer. Is this the modular representation of 4768?