CSE 200
Computability and Complexity
Calibration Homework

April 4, 2007

1. A palindrome is a sequence of symbols $x_1...x_n$ which is the same in reverse, $x_1...x_n = x_n...x_1$. How many palindromes of length n over an alphabet Σ of size s are there? Prove your answer.
2. Assume that L is a language closed under concatenation. Prove that $L^+ = L$. When is $L^* = L$?
3. Problem 0.12, page 27 of the textbook.
4. a. Prove that any number n so that $n \ mod \ 4 = 3$ has a prime factor p with $p \ mod \ 4 = 3$. b. Prove that there are infinitely many primes p with $p \ mod \ 4 = 3$.
5. In your favorite programming language, write a program that takes no input and prints itself (its own code). Your program may not make system calls.