Homework #4

#1. (11 Points) Prove that the following is not a regular language: The set of strings of 0's and 1's that are of the form *w w*

#2. (10 Points) Show that the language L = $\{a^p\}$ p is prime is not a regular language

#3. (9 Points) Suppose *h* is the homomorphism from {0,1,2} to {a,b} defined by *h*(0) = a; *h*(1) = ab; *h*(2) = ba.

a) What is *h*(21120)
b) If L = 01*2, what is *h*(L)?
c) If L = a(ba)*, what is h^{-1}(L)?

#4. (20 Points) a) Show that the question: *Does L = S*?* for regular language L is decidable.

b) Show that the question, *Given a FA M over Σ, does M accept a string of length* $\leq$ *2?* is decidable

#5. (Best answers will be posted to the bb) What is a CS or real world application of dfa state minimization?