Homework 6, part 1

November 4, 2009

1. Show that the following is an equivalence relation on the set of non-zero rational numbers: We have that if x and y are non-zero rationals, then $x \sim y$ if and only if there exists a non-zero rational q such that

$$x \;=\; q^4 y.$$

2. Write down the Hasse diagram for the partial ordering on the set of integers $1, 2, 4, 5, 10, 20, 25, 50, 100$, whereby aRb if and only if $a|b$.

3. Write down a finite state machine that accepts the following language on the alphabet $\Sigma = \{A, C, T, G\}$: All strings, except those having a triple T – i.e. TTT – somewhere. That is, the string ACACCCGTATTAC would be ok, but not ACACCCGTTTATTAC.