Take home exam 4

Due April 26 2pm

1. Let *M* be a universal Turing machine and c its notion of Kolmogorov complexity. Prove that the statement $c(t)<n$ is a Σ_1 formula in variables *t, n*. Use any coding of finite binary sequences by natural numbers.
2. Is the formula $c(t)<n$ equivalent to a bounded formula? Justify your answer.
3. Let *f* be a function from natural numbers to natural numbers such that for every number *n*, if a sentence has fewer than *n* many characters and it is provable from PA, then it is provable in fewer than *f(n)* many steps. Show that the function *f* is not computable.