

Fall 2009

COMP 691E Discrete Mathematics of Paul Erdős  
Take-home midterm  
Due on Wednesday October 21 in class.

Adapt Erdős's proof of the Ramsey number lower bound  $r(k, k) > 2^{k/2}$  to get a function  $f$ , growing as fast as you can make it, with the following property:

The integers  $1, 2, \dots, f(k)$  can be coloured red and white  
so that there is no monochromatic arithmetic progression of  $k$  terms.

I will consider answers  $f_1$  and  $f_2$  equally good if  $\lim_{k \rightarrow \infty} f_1(k)/f_2(k) = 1$ .