Math 206A **W01 D.**

Assignment #3

Due Friday, January 26.

Note: Occasional things will be posted on the class web site, accessible through `http://www.math.ucla.edu/courses`

Problem D-1. In class it was shown how to construct a pair of 10×10 orthogonal Latin squares starting from a 3×3 pair. The construction going from $m \times m$ to $(3m+1) \times (3m+1)$ follows the same pattern. Explain briefly how to do this construction, simply putting quantities in terms of m that were specific integers before. No proofs are necessary, but do point out explicitly the sizes of blocks you define (C, etc.)—you may need to do some analysis to determine what the block sizes should be to end up with the correct size of the full matrix.

Problem D-2. Find $N(p_1, \ldots, p_c; 1)$.

Problem D-3. Write down a sequence of 16 integers with no monotonic subsequence of length greater than 4.

Problem D-4. See how large a $k \times k$ 0,1-matrix you can make that has no principal 3×3 submatrix that is constant above the diagonal and constant below the diagonal. (Just try and see what you can do with modest effort; no proof required.)

Problem D-5. Prove the infinite Ramsey theorem for 2-coloring triples.