WEEK 10 PROBLEMS

Math 6014

1. Let G be a graph on n vertices with no $K_{2,t}$ subgraph. Prove that G has at most $(1+o(1))\frac{1}{2}(t-1)^{1/2}n^{3/2}$ edges.

2. Prove that there exists a constant c such that given a set of n points in the plane, at most $cn^{3/2}$ pairs of those points are a unit distance apart.

3. Let G be a graph on n vertices and at least kn edges. Prove that every tree with k edges is isomorphic to a subgraph of G.

4. Prove that $z(n,m,2,2) \leq nm^{1/2}+m$.

5. Prove that in any configuration of n points and m lines in the plane there are at most $O(nm^{1/2}+m)$ point-line incidences.

6. Determine the maximum number of edges in a graph on n vertices with no subgraph consisting of two vertices and three pairwise internally disjoint paths joining those vertices.