Graph Theory

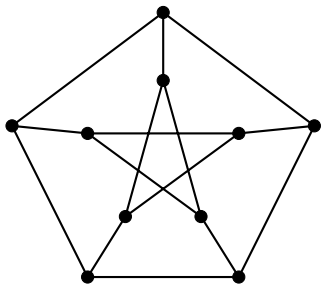
Instructor: Benny Sudakov

Assignment 11

To be completed by May 19

Unless noted otherwise, all graphs considered are simple. The solution of every problem should be no longer than one page.

Problem 1: Show that the Petersen graph (see below) is not planar.



Problem 2: Let G be a 2-connected graph on $n \geq 5$ vertices which does not contain a $K_{2,3}$-subdivision.

(a) Show that G does not contain a K_4-subdivision.

(b) Deduce that G has at most $2n - 3$ edges.

[Hint: .secitrev rehto lla ot detcennoc xetrev wen a ddA]

Problem 3: Let H be a graph of maximum degree 3. Suppose G is a graph such that G/e contains an H-subdivision for some edge e of G. Show that G also contains an H-subdivision.

Problem 4: Construct a planar graph such that any of its convex planar drawings have 3 vertices on the same line. Find a planar graph that does not have a convex planar drawing at all.