Homework 12

Prove that every 3-regular simple graph with no cut-edge decomposes into copies of $P_4$, the path on four vertices.

Exercise 33

Exhibit a maximum matching in the graph shown below, and give a short proof that there is no larger matching.

Exercise 34

Let $G$ be a bipartite graph with partite sets $X$ and $Y$. Prove that $\alpha'(G) = |X|$ or there exists a set $S \subseteq X$ such that $\alpha'(G) = |X| - |S| + |N(S)|$, where $\alpha'(G)$ denotes the size of a maximum matching in $G$.

Exercise 35

Let $G$ be a connected graph on an even number of vertices. Show that if $G$ does not contain $K_{1,3}$ as an induced subgraph then $G$ has a perfect matching.

Homework due: 19.12.2007, 11:00 AM.