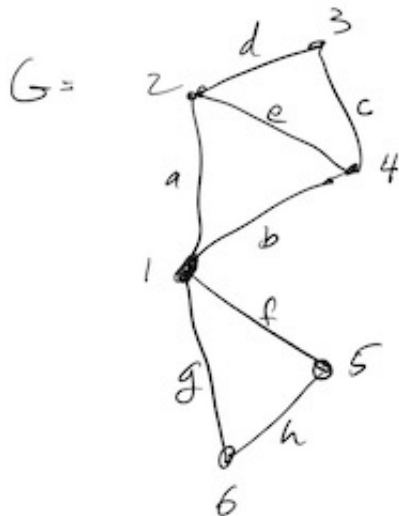# Worksheet for graph theory lecture 13

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Given the graph below, draw the following edge induced subgraphs (see lecture 9):

$$G[\{a, b, e\}], G[\{a, b, f, g, h\}]$$

Also, with the same graph, find subsets $S_1, S_2 \subset E[G]$ such that $G[S_1], G[S_2]$ are the blocks of $G$.



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Problem (corrected!): Suppose that $v$ is a cut vertex in a graph $G$, and let $H_1, H_2, H_3, \ldots, H_k$ be the different components in $G - v$. Show that if $C \subset G$ is a cycle containing $v$, then $C$ can only intersect one of these components -- i.e. $C \cap H_i = \emptyset$ for all but one value of $i$.

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Problem: Show that if $e$ is an edge in $G$, then $G$ is nonseparable if and only if $G[[e]]$ is nonseparable.

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Problem: Show that if $G$ is nonseparable, than any two edges lie on a common cycle (use the subdivision strategy of the video).