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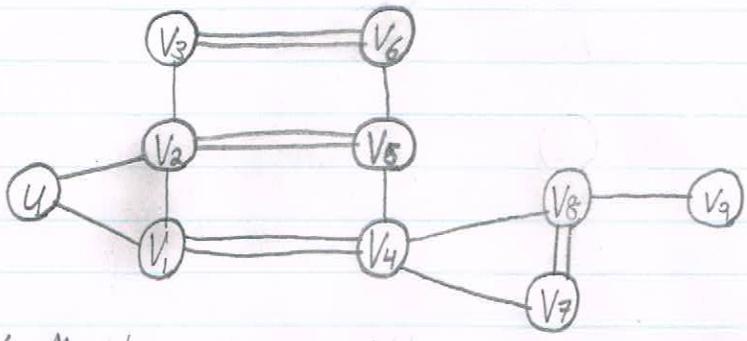
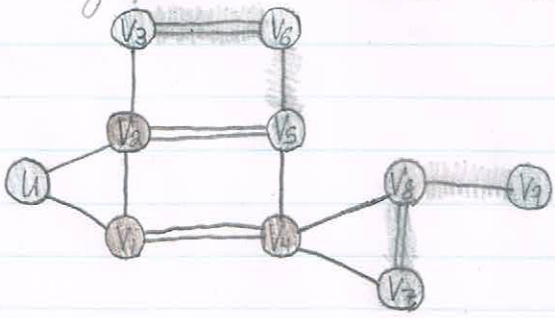
MATH 3802 Tutorial March 26:

Let $G=(V,E)$ denote the undirected graph depicted below:



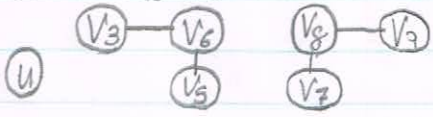
Let M denote the matching consisting of the double edges:

(1) Show the graph G/S & the value $o(G/S)$ where $S=\{V_1,V_2,V_4\}$:



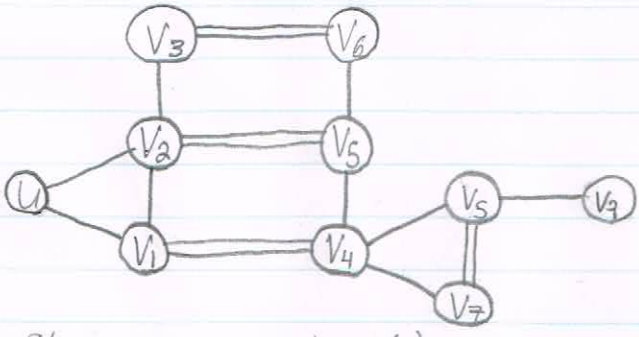
* C is a node cover if every edge has at least one end in C

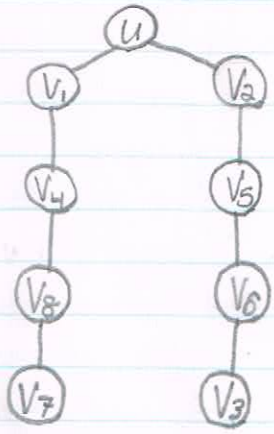
G/S: $o(G\setminus S)=3$



(2)

a) Show a depiction of T:

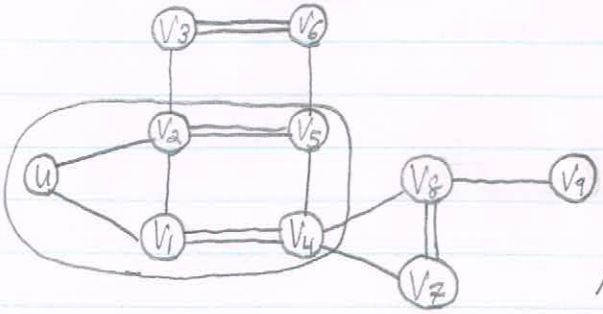




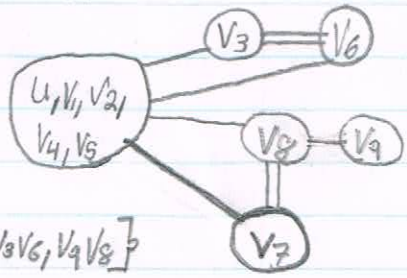
b) Show the nodes in $E(T)$:

$E(T)=\{U,V_4,V_7,V_5,V_3\}$

c) Show the graph $G'=G/S$ & the matching $M'=M/S$ in G' where S denotes the blossom $\{U,V_1,V_4,V_5,V_2\}$:



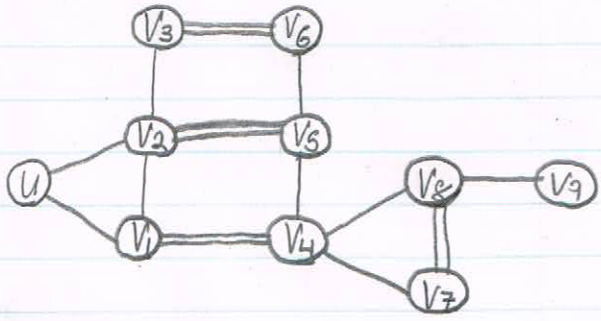
$G'=G/S$



$M'=M\setminus S=\{V_3V_6, V_9V_8\}$

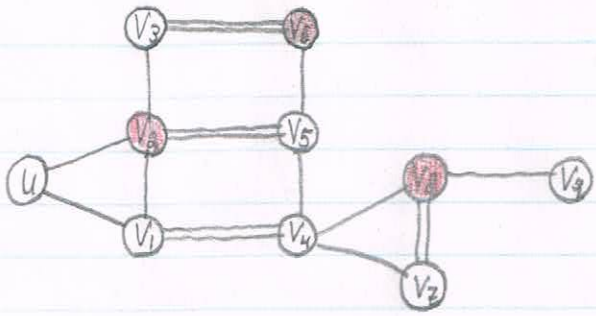
d) Show an M-augmenting path in G', use it to augment the matching & extend it to a perfect matching in G:

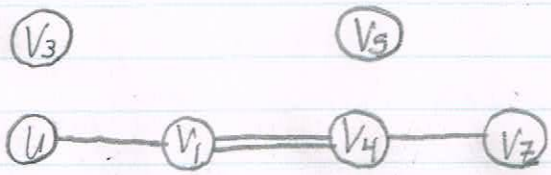
$S, Sv_8, v_8, v_8v_9, v_9$



ASK:

① Ask for the same info w/ $S=\{v_2, v_6, v_8\}$:

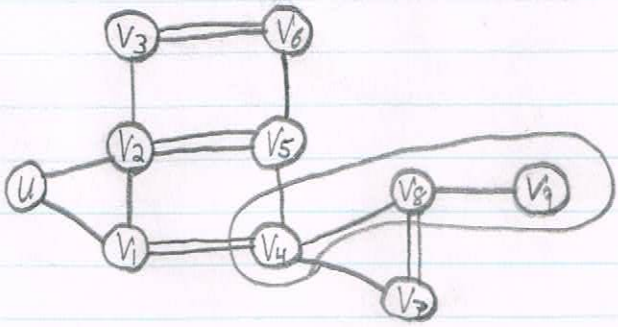




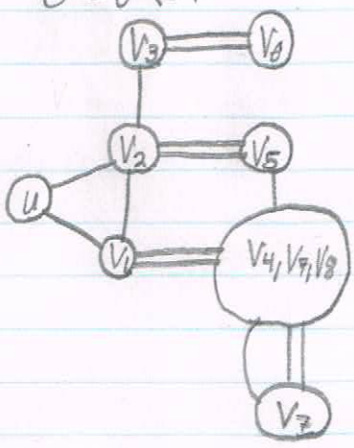
$o(G \setminus S) = 4$

② Ask for the same as c) & d) w/ root v_9 & $S=\{v_4, v_8, v_7\}$

c)

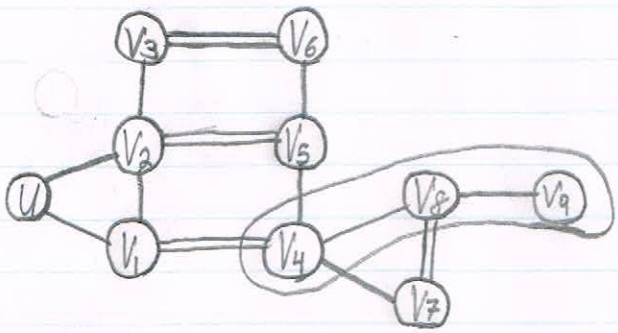


$G = G \setminus S$:



$M = M \setminus S = \{uv_1, v_2v_5, v_3v_6\}$

d)



thus, we get:

S, SV1, V1, V1U, U

S, SV5, V5, V5V2, V2, V2V3, V3V6