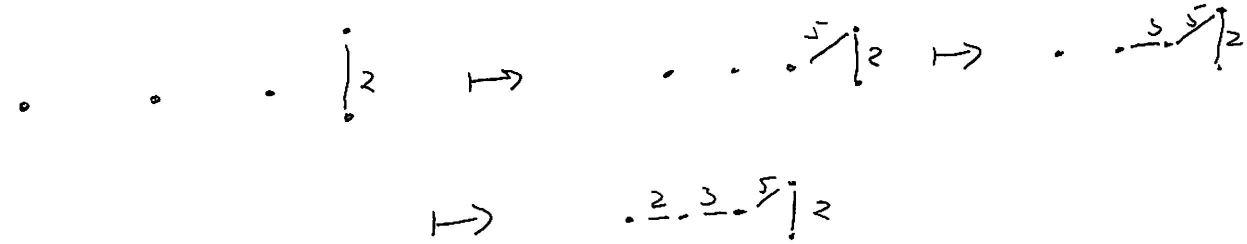
Exam #2 : solutions

1) 4 leaves w/ labels 7, 10, 11, 12, 13.

2)



3) a- True consider

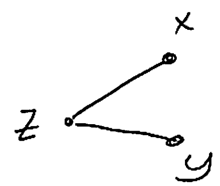
b- True. $\mathcal{G} = \{K_2\}$. If G is cntd, w/ more than two vertices, and it has a ~~cut-ve~~ bridge then by thm 7.2 at least one of its endpts is a cut-vertex.

c- As $\kappa(G) \geq 2$, then G is cntd. If $G-e$ were disconnected, then e is a bridge. so $\lambda(G) = 1$. But by thm $\lambda(G) \geq \kappa(G)$. so False.

5) Let G be such that $\kappa(G) \geq 3$. As G is cntd w/ order $n \geq 2$, then $\exists$ vertices x, y w/ $x \sim y$. By whitney's thm $\exists$ at least 3 int. disj paths P_1, P_2, P_3. We may assume (wlog) that P_1 & P_2 are not the edge xy. Now P_1, P_2 & the edge xy constitute a chorded cycle.

4) This is true. Note that f is a bridge in $G-e$. (why?) So f is on <u>NO</u> cycle in $G-e$. It follows that every cycle containing f, in G, must also contain e.

6) If G is nonseparable, then $\kappa(G) \geq 2$. By thm $\exists$ int. disj $z-x$ and $z-y$ paths, i.e., we have:



$\therefore$ $\exists$ an $x-y$ path containing z.