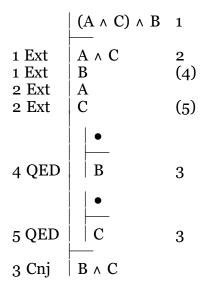
2.2.x. Exercise questions

1. Restate the derivation below as a tree-form proof, labeling each horizontal line with the number of the stage at which it is entered. That is, do what is done with the example in 2.2.4



- **2.** Use the system of derivations to establish each of the following claims of entailment:
 - **a.** $A \wedge B \Rightarrow B \wedge A$
 - **b.** $A \Rightarrow A \wedge A$
 - **c.** $A \land (B \land C) \Rightarrow (C \land B) \land A$
 - **d.** A, B \wedge C, D \Rightarrow (C \wedge (B \wedge A)) \wedge B [The derivation for **d** will have three premises above the initial horizontal line.]
 - **e.** $A \wedge (B \wedge C) \Rightarrow (B \wedge A) \wedge (C \wedge A)$

Glen Helman 14 Aug 2004