2.3.x. Exercise questions

Use the basic system of derivations to check each of the claims below; if a derivation indicates that a claim fails, present a counterexample (that is, give an interpretation that divides an open gap and calculate truth values for the premises and conclusion from it—as is done in the example in 2.3.3):

1. $A \Rightarrow A \wedge B$

2. $A \wedge B \Rightarrow A \wedge (B \wedge A)$

3. $B \wedge E, C \wedge \top \Rightarrow (A \wedge B) \wedge (C \wedge D)$

4. $A \wedge B, B \wedge C, C \wedge D \Rightarrow A \wedge D$

5. $A, B \wedge A, D \Rightarrow B \wedge ((C \wedge A) \wedge D)$