

3.4.x. Exercise questions

1. The following arguments are not formally valid. In each case, use a derivation to show this and present a counterexample that the derivation leads you to.
 - a. $\neg B / \neg (A \wedge \neg B)$
 - b. $\neg (A \wedge B) / \neg A \wedge \neg B$
 - c. $\neg (A \wedge B), \neg (B \wedge C) / \neg (A \wedge C)$
2. Use derivations to check the following claims of entailment. If the claim fails, present a counterexample that the derivation leads you to.
 - a. $\neg (A \wedge \neg B) \Rightarrow B$
 - b. $\neg (A \wedge B) \Rightarrow \neg (B \wedge A)$
 - c. $\neg (A \wedge \neg B) \Rightarrow \neg (B \wedge \neg A)$
 - d. $\neg (A \wedge B), \neg (B \wedge C), B \Rightarrow \neg A \wedge \neg C$
 - e. $\neg (A \wedge \neg (B \wedge \neg (C \wedge \neg D))) \Rightarrow \neg (A \wedge \neg (B \wedge D))$