1. a) We will prove this by contradiction. Suppose (bwoc) \( \{A \rightarrow (B \rightarrow \neg A)\} \not\models (B \rightarrow \neg A) \). Then there is an assignment \( A \) such that \( A(A \rightarrow (B \rightarrow \neg A)) = 1 \) and \( A(B \rightarrow \neg A) = 0 \). Therefore, (from the latter) \( A(B) = 1 \) and \( A(A) = 1 \). But then \( A(A \rightarrow (B \rightarrow \neg A)) = 0 \), a contradiction.

b) Counterexample: Consider \( A \) where \( A(A) = 1 \), \( A(B) = 0 \), and \( A(C) = 0 \).

c) BWOC, suppose \( \{A \rightarrow C, B \rightarrow C, A \lor B\} \not\models C \). Then there is an assignment \( A \) such that \( A(A \rightarrow C) = 1 \), \( A(B \rightarrow C) = 1 \), \( A(A \lor B) = 1 \), and \( A(C) = 0 \). Since \( A(A \rightarrow C) = 1 \) and \( A(C) = 0 \) it must be the case that \( A(A) = 0 \). Similarly, we can infer that \( A(B) = 0 \). But then, \( A(A \lor B) = 0 \), a contradiction.

d) Consider \( A \) where \( A(A_i) = 1 \) if \( i \) is odd and \( A(A_i) = 0 \) if \( i \) is even.

2. BWOC, suppose \( S \models F \) and \( S \cup \{\neg F\} \) is satisfiable. Then there is an assignment \( A \) such that \( A \) makes every element of \( S \) true and \( A \) makes \( \neg F \) true. Then \( A \) makes \( F \) false and satisfies all members of \( S \), a contradiction with \( S \models F \).