Problem set 3, problem 3, defined the following language and enumerated the following statements:

Consider a universe whose entities are stores, product (e.g. "cabbage", "Can of Coke", etc.) and items (some particular head of cabbage or can of coke.) Let \( \mathcal{L} \) be the first-order language with the following non-logical symbols:

- \( \text{at}(I,S) \) — Predicate: Item \( I \) is at store \( S \).
- \( \text{carry}(S,P) \) — Predicate: Store \( S \) carries product \( P \).
- \( \text{stock}(S,P) \) — Predicate: Product \( P \) is in stock at store \( S \).
- \( \text{inst}(I,P) \) — Predicate: Item \( I \) is an instance of product \( P \).
- \( \text{superxxx}, \text{deli94}, \text{cokecan101}, \text{canofcoke}, \text{tomato} \) — Constants.

Consider the following statements in \( \mathcal{L} \):

A. Product \( P \) is in stock at store \( S \) if and only if some instance of \( P \) is at store \( S \).
B. If \( S \) does not carry product \( P \), then \( P \) is not in stock at \( S \).
C. SuperXXX carries every product that Deli94 does.
D. CokeCan101 is at Deli94.
E. CokeCan101 is an instance of CanOfCoke.
F. Tomatoes are out of stock at Deli94.
G. SuperXXX carries CanOfCoke.
H. CokeCan101 is not an instance of a tomato.

**Problem 1:** Give a resolution proof of G from (A-E). You need not show the intermediate states of the Skolemization process. You do need to show every resolution used in the proof.

**Problem 2:** Give a resolution proof of H from (A-D,F).

**Problem 3:** The clauses used in the proof in problem 1 are all Horn clauses. Give a forward-chaining proof of this result.