FORWARD CHAINING:

1. Use Forward Chaining to derive new facts. Give the newly generated facts IN ORDER as the algorithm produces them. Show your work. (6 pts)

You are given the following information (in order) in a KB:

R1: D → G
R2: A → B
R3: B → C
R4: C → D
R5: B → E
R6: A → F

You now enter fact A.

BACKWARD CHAINING:

2. Use Backward Chaining to prove C is TRUE. Show your work with a tree. (4 pts)

You are given the following information in a KB:

R1: K → H      F1: Z
R2: A&B → C    F2: G
R3: D&E → F    F3: K
R4: Z → A
R5: G&H → B

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3. Prove that “Jerry is an actor” by resolution using proof by contradiction starting with and using the negated goal of \( \neg \text{Actor}(\text{Jerry}) \) and then prove \( \text{Actor}(\text{Jerry}) \). The symbols \( X_1, X_2, \) and \( X_3 \) are variables to be substituted. Carve away terms until you are left with a contradiction. Show your work. There are multiple paths/solutions that could be found. (8 pts)

Facts/Rules in knowledge base:
1: \( \text{RockStar}(X_1) \lor \neg \text{Millionaire}(X_1) \lor \text{Actor}(X_1) \)
2: \( \text{Millionaire}(X_2) \lor \neg \text{Drives}(X_2, \text{Ferrari}) \)
3: \( \text{Likes}(X_3, \text{Snakes}) \lor \neg \text{RockStar}(X_3) \)
4: \( \text{Drives}(\text{Jerry}, \text{Ferrari}) \)
5: \( \neg \text{Likes}(\text{Jerry}, \text{Snakes}) \)