For each question assume the relation $R$ has the schema $(A, B, C, D, E, F)$. Note this has one more attribute than we use in class.

1. Prove or disprove the Lefthand Reduction Rule: $AB \rightarrow AC \Rightarrow B \rightarrow C$

2. Prove or disprove the Composite Key Rule: If $AB$ is a candidate key for $R$, then $A \not\rightarrow B$ and $B \not\rightarrow A$.

3. Let the set of functional dependencies $\mathcal{F} = \{ABC \rightarrow CDE, BC \rightarrow AC, E \rightarrow C\}$.
   (a) Find the canonical cover for $\mathcal{F}$.
   (b) Find the candidate keys for $\mathcal{F}$.

4. Let the set of functional dependencies $\mathcal{F} = \{AB \rightarrow CDE, C \rightarrow B, D \rightarrow A, AF \rightarrow BF\}$.
   (a) Find the canonical cover for $\mathcal{F}$.
   (b) Find the candidate keys for $\mathcal{F}$.

5. Let the set of functional dependencies $\mathcal{F} = \{AB \rightarrow CDE, C \rightarrow B, D \rightarrow A, AF \rightarrow BF\}$.
   (a) Using the algorithm discussed in class, find a 3NFLJDP decomposition.
   (b) Using the algorithm discussed in class, find a BCNFLJ decomposition.
   (c) Prove or disprove your BCNF decomposition is DP.

6. Let the set of functional dependencies $\mathcal{F} = \{ABC \rightarrow CDE, BC \rightarrow AC, E \rightarrow C\}$.
   (a) Using the algorithm discussed in class, find a 3NFLJDP.
   (b) Using the algorithm discussed in class, find a BCNFLJ.
   (c) Prove or disprove your BCNF decomposition is DP.