6. Prove the following if $(\neg P \vee R) \wedge (\neg Q \vee R) \wedge (P \vee Q)$ then R Prove by contradiction, using resolution.	Given: 1. ¬P ∨ R 2. ¬Q ∨ R 3. P ∨ Q To prove: R Assume the negation of the conclusion: ¬R resolve ¬P ∨ R and ¬R to derive P resolve P ∨ Q and P to derive Q resolve ¬Q ∨ R and ¬R to derive Q Now we have derived both Q and R, which contradicts the original assumption ¬R. Therefore, our assumption was incorrect, and R must be true
7. Use resolution to prove: if $(\neg P \vee Q) \wedge \neg(\neg(R \Rightarrow \neg Q) \vee \neg R)$ then $\neg P$ Construct your proof as follows. a) Convert the premise to conjunctive normal form. b) Using the re-written premises, prove by contradiction, using resolution.	a) Given: (¬P ∨ Q) ∧ ¬(¬(R ⇒ ¬Q) ∨ ¬R) Step 1: Apply De Morgan's Laws: ¬(R ⇒ ¬Q) ≡ ¬(¬R ∨ ¬Q) ≡ R ∧ Q Step 2: Substitute back: (¬P ∨ Q) ∧ ¬(R ∧ Q ∨ ¬R) Step 3: Apply De Morgan's Laws: (¬P ∨ Q) ∧ (¬(R ∧ Q) ∧ R) Step 4: Distribute the negation: (¬P ∨ Q) ∧ ((¬R ∨ ¬Q) ∧ R) Step 5: Distribute again: (¬P ∨ Q) ∧ (¬R ∧ R ∨ ¬Q) Step 6: Simplify ¬R ∧ R to False: (¬P ∨ Q) ∧ (False ∨ ¬Q) Step 7: Simplify False ∨ ¬Q to ¬Q: (¬P ∨ Q) ∧ ¬Q b) Given: (¬P ∨ Q) ∧ ¬Q To prove: ¬P Assume the negation of the conclusion: P We have: ¬P ∨ Q ¬Q P (negation of conclusion) resolution: resolve ¬P ∨ Q and P to derive Q resolve ¬Q and Q to derive False Since we derived a contradiction (False), our assumption that P was true must be incorrect. ¬P must be true.