

**Negate each statement.**

1. Marla served supper to Bill and Jean.
2. If John won the golf tournament, he became the national champion.
3. Either Shawna or Shaneel cooked dinner.
4. All birds have feathers, and all feathered things are birds.

**Convert each statement into symbolic form.**

5. "If Benita made eggs, then she could have made pancakes" means the same as "Benita did not make pancakes, but she made eggs instead."
6. "Shu or Jay did not win the spelling bee" means that "Shu and Jay won the spelling bee" is false.
7. "Not pleasing self is to please Christ" is the same as "not pleasing Christ is to please self."

**Evaluate each statement as true or false.**

8. "If Benita made eggs, then she could have made pancakes" means the same as "Benita did not make pancakes, but she made eggs instead."
9. "Shu or Jay did not win the spelling bee" means that "Shu and Jay won the spelling bee" is false.
10. "Not pleasing self is to please Christ" is the same as "not pleasing Christ is to please self."

**Give the reason for each step shown in the proof that  $(A \rightarrow B) \leftrightarrow (\sim A \vee B)$ .**

11.  $(A \rightarrow B) \leftrightarrow (\sim B \rightarrow \sim A)$
12.  $(A \rightarrow B) \leftrightarrow \sim [\sim (\sim B \rightarrow \sim A)]$
13.  $(A \rightarrow B) \leftrightarrow \sim (\sim B \wedge A)$
14.  $(A \rightarrow B) \leftrightarrow (\sim \sim B \vee \sim A)$
15.  $(A \rightarrow B) \leftrightarrow (B \vee \sim A)$
16.  $(A \rightarrow B) \leftrightarrow (\sim A \vee B)$

Use a truth table to show that the statement is not an equivalence.

17.  $(A \rightarrow B) \leftrightarrow (\sim A \rightarrow \sim B)$

18.  $\sim(A \rightarrow B) \leftrightarrow (\sim A \wedge B)$

**Construct the table.**

19. Show the truth table for the Negation of Biconditional Rule.

**Answer the question.**

20. Explain the significance of I John 5:12 to logic.