Part D. These are the laws of logic we discussed above. Give complete truth-tables for these pairs of sentence forms to show that they are equivalent. Be sure to label the columns as "sent 1," "sent 2," or "aux." Use the space on these two pages efficiently.

1. \( \sim(\sim p) = p \)  
   Double Negation

2a. \( \sim(p \& q) = \sim p \lor \sim q \)  
   De Morgan's Laws

2b. \( \sim(p \lor q) = \sim p \land \sim q \)  
   De Morgan's Laws

3. \( p \supset q = \sim q \supset \sim p \)  
   Contraposition

4. \( p \supset q = \sim p \lor q \)  
   Conditional Relation

5. \( p \equiv q = (p \supset q) \land (q \supset p) \)  
   Bicondition

6. \( (p \& q) \supset r = p \supset (q \supset r) \)  
   Exportation

7a. \( p \& p = p \)  
   Duplication

7b. \( p \lor p = p \)  
   Duplication

8a. \( p \& q = q \& p \)  
   Commutation

8b. \( p \lor q = q \lor p \)  
   Commutation

9a. \( p \& (q \& r) = (p \& q) \& r \)  
   Association

9b. \( p \lor (q \lor r) = (p \lor q) \lor r \)  
   Association

10a. \( p \& (q \lor r) = (p \& q) \lor (p \& r) \)  
   Distribution

10b. \( p \lor (q \& r) = (p \lor q) \& (p \lor r) \)  
   Distribution