

1. Determine if the statement is a tautology, a self-contradiction, or neither.

$$(p \leftrightarrow q) \vee \sim (q \leftrightarrow p)$$

A. Tautology

B. Self-Contradiction

C. Neither

2. Write the inverse of the statement  $p \rightarrow (q \vee r)$ .

A.  $\sim p \rightarrow \sim (q \vee r)$

B.  $\sim (q \vee r) \rightarrow \sim p$

C.  $(q \vee r) \rightarrow p$

3. For the following exercise, let  $p$  be the statement “I need to talk to my friend,” and  $q$  be the statement “I will send her a text message.”

Write the following statement in symbols:

*If I need to talk to my friend, I will send her a text message.*

A.  $\sim p \rightarrow \sim q$

B.  $\sim q \rightarrow \sim p$

C.  $p \rightarrow q$

D.  $q \rightarrow p$

4. Write the inverse of the following statement:

*If she earns enough money this summer, then she will buy a car.*

A. If she buys a car, then she earned enough money this summer.

B. If she doesn't earn enough money this summer, then she won't buy a car.

C. If she doesn't buy a car, then she didn't earn enough money this summer.

5. The two statements  $p \wedge q$  and  $\sim q \vee \sim p$  are

A. logically equivalent.

B. neither logically equivalent nor negations.

C. negations.

6. Write the inverse of the statement  $(p \vee \sim q) \rightarrow r$ .

A.  $\sim r \rightarrow \sim (p \vee \sim q)$

B.  $r \rightarrow (p \vee \sim q)$

C.  $\sim (p \vee \sim q) \rightarrow \sim r$

7. Write the contrapositive of the statement  $p \rightarrow (q \vee r)$ .

A.  $\sim p \rightarrow \sim (q \vee r)$

B.  $(q \vee r) \rightarrow p$

C.  $\sim (q \vee r) \rightarrow \sim p$

8. Write the converse of the statement  $(q \vee \sim r) \rightarrow (p \vee r)$ .

A.  $(p \vee r) \rightarrow (q \vee \sim r)$

B.  $\sim (q \vee \sim r) \rightarrow \sim (p \vee r)$

C.  $\sim (p \vee r) \rightarrow \sim (q \vee \sim r)$