

1. Prove the following equivalences.

$$(a \Rightarrow b) = (\neg a \vee b)$$

$$((a \Rightarrow b) \wedge (b \Rightarrow a)) = (a = b)$$

2. Which of the following are valid inferences? (Write yes or no in the blank.)

a. \_\_\_\_\_ From  $a \vee b$  infer  $a \wedge b$

b. \_\_\_\_\_ From  $a \wedge b$  infer  $a \vee b$

c. \_\_\_\_\_ From  $a \Rightarrow b, a$  infer  $b$

d. \_\_\_\_\_ From  $a \Rightarrow b, b$  infer  $a$

e. \_\_\_\_\_ From  $a \wedge b, \neg b$  infer  $a$