

LOGIC EXERCISES

1. Assuming A, B, C are all true, what is:

- a. $A \vee B$?
- b. $A \vee \sim B$?
- c. $\sim A \wedge \sim B \wedge C$?
- d. $\sim \sim A$?
- e. $\sim A \Rightarrow \sim B$?

2. Using a truth table prove the following axioms:

- a. $A \wedge (A \vee B) \Leftrightarrow A$
- b. $(\sim B \wedge (A \Rightarrow B)) \Rightarrow \sim A$
- c. $\sim(A \wedge B) \Leftrightarrow \sim A \vee \sim B$

3. A variation on basic modus ponens is:

$$\frac{\forall x.P(x) \Rightarrow Q(x) \quad P(a)}{Q(a)}$$

Use the rule to show that if all men are mortal and Socrates is a man, then Socrates is mortal. Then use the rule to show that if all people under five feet tall are happy, and Julia Roberts is under five feet tall, then Julia Roberts is happy.

[ANSWERS](#)