

Section 1.1, Problem 32: Construct a truth table for each of the following compound propositions:

a. $p \rightarrow \neg p$

b. $p \leftrightarrow \neg p$

c. $p \oplus (p \vee q)$

d. $(p \wedge q) \rightarrow (p \vee q)$

e. $(q \rightarrow \neg p) \leftrightarrow (p \leftrightarrow q)$

f. $(p \leftrightarrow q) \oplus (\neg p \leftrightarrow \neg q)$

Section 1.2, Problem 32: The police have three suspects for the murder of Mr. Cooper: Mr. Smith, Mr. Jones, and Mr. Williams. Smith, Jones, and Williams each declare they did not kill Cooper. Smith also states that Cooper was a friend of Jones and that Williams disliked Cooper. Jones also states that he did not know Cooper and that he was out of town the day Cooper was killed. Williams also states that he saw both Smith and Jones with Cooper the day of the killing and that either Smith or Jones must have killed him. Can you determine who the murderer was if

- a.** one of the three men is guilty, the two innocent men are telling the truth, but the statements of the guilty man may or may not be true.
- b.** innocent men do not lie, but no other information is known. (One, none, or more than one of the men may be guilty.)