Exercise 1. Determine the prime constituents of each of the following statements, and use this to express these statements symbolically.

a. If I am tired or hungry, then I cannot study.

b. If it is foggy tonight, then either John must take a taxi or he can't go out.

c. If the Pirates or the Cubs lose and the Giants win, then the Dodgers will be out of first place and, furthermore, I will lose a bet.

d. The sum of two odd integers is even. [*Hint:* This is an implication.]

Exercise 2. Let P, Q and R be statements. Construct truth tables for the following compound statements.

a. $P \to (Q \vee R)$

b. $P \to (Q \wedge R)$

c. $(P \to Q) \vee R$

d. $(P \to Q) \wedge R$

Exercise 3. You visit an island with two types of people: knights (who always tell the truth) and knaves (who always lie). You are approached by two islanders, A and B. Islander A tells you "B is a knight." Islander B then says "A and I are of opposite type." Determine (with justification!) what types A and B are. A truth table may or may not be helpful.