

Discrete Mathematics

Exercise 1

Let \mathbf{p} and \mathbf{q} be the respective Propositions "Swimming at New Jersey seeshore is allowed", "Sharks have been spotted near seeshore". Express each of the following compound propositions as an English sentence :

1. $\neg p \vee q$.
2. $\neg p \vee (p \wedge \neg q)$.

Exercise 2

Let \mathbf{p} and \mathbf{q} be the respective Propositions "it is below freezing" , "it is snowing". Write these propositions using \mathbf{p} and \mathbf{q} and logical connectives.

1. It is below freezing but not snowing.
2. It is not below freezing and it is not snowing
3. it is below freezing only if is also snowing

Exercise 3

Construct a Truth Table for the following Compound propositions.

1. $p \rightarrow (\neg q \vee r)$
2. $(p \rightarrow q) \vee (\neg p \rightarrow r)$

Exercise 4

Show that the following conditional statements is a tautology by using truth tables.

$$[p \wedge (p \rightarrow q)] \rightarrow q$$

Exercise 5

Show that the following conditional statements is a tautology without using truth tables.

$$\neg(p \rightarrow q) \rightarrow \neg q$$