

Math 2283 - Introduction to Logic

Quiz #7 - 2016.02.01 Solutions

1. State a definition of two objects x and y being equal.

There are several definitions given, the most used one in the first two sections of chapter 3 is:

$x = y$ if, and only, if, x has every property that y has and conversely.

2. State the Rule of Detachment in symbolic logic form.

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

3. State the Rule of Substitution (or at least give a general idea of what it is).

Given a sentential function which is a tautology, replacing any of the variables consistently throughout the sentence by other sentential functions results in yet another tautology. For example, the sentential function $p \rightarrow (p \rightarrow q)$ is a tautology. If we replace p by $q \vee r$ and q by $\sim q \wedge r$, then the following sentence is also a tautology:

$$(q \vee r) \rightarrow [(q \vee r) \rightarrow (\sim q \wedge r)]$$