Math 2283 - Introduction to Logic

Quiz #12 - 2016.02.12 Solutions

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1. What quantity does the following quantified statement correspond to:

$$\exists\, x\ \forall\, y\ \left[\, P(x) \wedge \{\, P(y) \rightarrow (y = x)\,\}\,\right]$$

This is the definition of *exactly one*.

2. What quantity does the following quantified statement correspond to:

$$\forall\, x, y, z\ \left[\, \{P(x) \wedge P(y) \wedge P(z)\} \rightarrow \{(z = y) \vee (z = x)\}\,\right]$$

This is the definition of *at most two*.

3. What is the difference between a sentential function and a designatory function?

When replacing variables by constants in a sentential function, the result is a sentence. When replacing variables by constants in a designatory function, the result is another constant.

4. State the Rule of Detachment.

Given a conditional sentence is true, as is its hypothesis, then the conclusion by itself is also true.