Math 2283 - Introduction to Logic

Quiz #1 - 2010.08.20

Solutions

---

1. Classify each of the following as either sentences, sentential functions or designatory functions.

a) $3x^2 - x + 1 > 0$

sentential function

b) $\underset{x}{\mathbf{A}} \left[3x^2 - x + 1 > 0 \right]$

sentence

c) $\underset{x}{\mathbf{A}} \left[3x^2 - x + 1 > y \right]$

sentential function

d) $3x^2 - x + 1$

designatory function

e) $\underset{x}{\mathbf{A}} \underset{y}{\mathbf{E}} \left[3x^2 - x + 1 > y \right]$

sentence

2. Determine if each of the following statements are true or false.

a) $\underset{x}{\mathbf{A}} \underset{y}{\mathbf{E}} \left[y < x^2 \right]$

This is true, for instance, $y = -1$ regardless of the chosen x value.

b) $\underset{y}{\mathbf{E}} \underset{x}{\mathbf{A}} \left[y < x^2 \right]$

This is true, by the argument from the previous part! .

c) $\underset{x}{\mathbf{A}} \underset{y}{\mathbf{E}} \left[y^2 < x \right]$

This is false, for instance no y value can be found such that for $x = -1$, $y^2 < -1$.