

338.001, VL Logic, Martina Seidl / Wolfgang Schreiner / Wolfgang Windsteiger, 2022W

Dashboard / My courses / 2022W338001 / Module FOA: First-Order Logic - Syntax, Semantics, and Pragmatics / FOA1Q

Quiz navigation



Show one page at a time

Finish review

Question 1

Correct

Mark 1.0 out of 1.0

Flag question

Started on Monday, 14 November 2022, 7:16 PM**State** Finished**Completed on** Monday, 14 November 2022, 7:31 PM**Time taken** 15 mins**Grade** 1.7 out of 5.0 (33.4%)Consider the following formula with variables a, b, n (and the usual precedence rules for the logical operators):

$$\forall a \in \mathbb{N}, n \in \mathbb{N}: a > n \vee \exists b \in \mathbb{N}: b \leq n \wedge a + b = n$$

1. Which variables are free in the \exists -formula?☒ a ✓☐ b☒ n ✓☐ none

Mark 1.0 out of 1.0

The correct answer is:

- ☐ a
- ☐ n

2. Which variables are free in the \forall -formula?☐ a☐ b☐ n☒ none ✓

Mark 1.0 out of 1.0

The correct answer is:

- ☐ none

Question 2

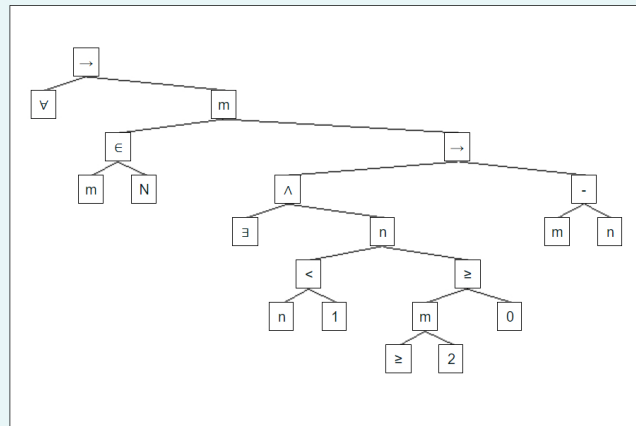
Partially correct

Mark 0.6 out of 2.0

Flag question

Take the following formula in first-order logic:

$$\forall m \in \mathbb{N}: (\exists n < m: n - 1 \geq 0) \rightarrow m \geq 2$$

Construct the abstract syntax tree of this formula in standard syntax (to get only a single variable without condition under each quantifier, you have to add some implicit logical connective). To do so, fill the following picture by moving each node to the correct position in the tree.

Die Antwort ist teilweise richtig.

You have correctly selected 6.

Question 3

Complete

Mark 0.1 out of 2.0

Flag question

Take the following statement in natural language:

*Every aunt is female and is a sibling of some parent of someone.**(Jede Tante ist weiblich und ist ein Geschwister eines Elternteils von jemandem.)*Write this statement as a closed formula (no free variables) in first-order logic in standard syntax (with all parentheses) using the predicates $isAunt(x)$ ("x is aunt"), $isFemale(x)$ ("x is female"), $isParent(y, x)$ ("y is parent of x"), and $isSibling(y, x)$ ("y is sibling of x").

Please use for logical quantifiers and connectives the syntax "forall", "exists", "~", "∧", "∨", "→", "↔", e.g.

$$(\text{forall } x: ((p(x) \vee (\sim q(x))) \rightarrow (\text{exists } y: r(x, y))))$$

(forall x: (isFemale(x) is sibling(x))

$(\text{forall } x.\text{is_female}(x) \rightarrow \text{dumb}(x)) \rightarrow$

Comment:

[Finish review](#)

[FOA1B](#)

Jump to...

[FOA2B](#)

