

Semantic Theory 2025: Exercise 3

Due by: Wednesday, May 14 at 10:00 am (before class)

Question 1

Translate the following into λ -expressions. Use subscripts to indicate the types of the λ -bound variables (e.g. $\lambda x_e.P(x)$ for an e -type x).

- $pink_{\langle\langle e,t\rangle,\langle e,t\rangle\rangle}$ (as in “Jumbo is a pink elephant”; the expression should have $pink^*_{\langle e,t\rangle}$ as the underlying first-order predicate)
- $and_{\langle e,\langle e,\langle\langle e,t\rangle,t\rangle\rangle\rangle}$ (as in “John and Suzy danced”; the expression should incorporate \wedge as the underlying operator)
- $not_{\langle\langle e,t\rangle,\langle e,t\rangle\rangle}$ (as in “Mark did not like the party”; the expression should incorporate \neg as the underlying operator)

Question 2

Translate the following sentences into λ -expressions, assuming the syntactic structure indicated by the brackets. Then use lambda conversions (β -/ η -/ α -conversion) to reduce to λ -free terms.

Use the terms you derived for *pink*, *and*, and *not* in Question 1. If you weren’t able to derive those terms, you can simply use the predicates $pink'$, and' , and not' (with the types indicated in Question 1).

Ignore the contribution of past/plural morphology, “is”/“are”/“did”, and “a”.

- Jumbo [is a [pink elephant]]
- [John and Suzy] danced
- Mark did [not [like the party] _{e}]]
- [Tim [and Mary]] are [not [pink elephants]]