Recall that we have modeled constituent *only* as a quantifier with the following denotation from Rooth (1985):

$$[\text{only}]_{(e,t)} = \lambda x. \lambda P_{(e,t)} \cdot \forall y. (P(y) \rightarrow y = x)$$

When the *only*-phrase “*only DP*” is in non-subject position, it will have to QR for type reasons. This was the source of some scope ambiguities (Day 4 handout).

Now consider the following sentence:

⋆ = John does not speak only [Spanish].

Under our approach to the interpretation of constituent *only*, the sentence ⋆ is expected to have two readings.

a. Draw trees and compute the truth conditions for both readings. Give types and meanings for each node. (The DP “Spanish” is type $e$.)

b. Give a paraphrase for each reading using adverb *only*.

c. Does the sentence ⋆ actually have both of these readings? If you are unsure, discuss with (other) native English speakers and/or describe contexts which would distinguish between the two readings.

Suppose that we wanted to adopt the “sane” scope theory of *only*, where *only* attracts its focus associate to its specifier. Here is a syntax we might imagine, simplified to not show the movement of the subject to Spec,TP:

```
                only
               /   \
   syntax_F     only
    /     \    /    \ 
 λx     VP  John   V
       \    \       \\
       \    \       \\
       \    \       \\
    studies x
```

a. Define a lexical entry for *only* that can be used given this syntax.

b. Give a derivation for *John only studies syntax_F* given this syntax and your lexical entry for *only*, and show that it yields the desired truth.

c. Discuss the relationship between your semantic denotation for *only* and Rooth’s, in (2).
d. What would happen if the lambda binder were above *only*, right below “syntax”? Is it possible to write a denotation for *only* that works this way?

(3) Consider the following examples:
   a. John can cook *only* with [carrots].
   b. John can cook with *only* [carrots].

   For each example, describe what reading(s) it has. For each possible reading, give a paraphrase using an adverb *only*, if possible.

(4) Consider the readings of questions with quantifiers.
   a. As we discussed in class, the sentence *What did everyone read?* is ambiguous between two readings. Give derivations for these readings based on the LFs in (24) and (25) on the Day 7 handout. What is the problem with (25)?
   b. According to our discussion, the following question is ambiguous: *Which book did more than two students read?*

   Give paraphrases for the predicted readings of the question. Are these readings indeed attested?
   c. What about questions with other types of quantifiers? Consider the readings of questions with the quantifiers *two students, most students, few students, only John, each student*. Is there a descriptive generalization of which quantifiers allow the pair-list reading?