Questions on Quantificational Determiners

(1) Extending Our Theory to Some Other Determiners [25 Points]

To begin, recall the concept of ‘the cardinality of a set’, which we defined as the number of members that the set has. Also, recall our special notation for cardinality (|X|):

\[ |A| = \text{‘the cardinality of } A' = \text{‘the number of members that } A \text{ has’} \]

Examples
(i) \[ | \{a, b, c\} | = 3 \]
(ii) \[ | \{a, b, c, d, a\} | = 4 \]
(iii) \[ | \{x : x \text{ is a US senator}\} | = 100 \]
(iv) \[ | \{y : y \text{ is a man and } y \text{ smokes}\} | = \text{the number of men who smoke.} \]

b. Question 1 [10 Points]
Please use the concept and notation for cardinality above to write a lexical entry for the determiner *three*.

c. Question 2 [5 Points]
Please use your lexical entry from Question 1 to provide a truth-conditional derivation for the following sentence (assuming the following syntax):

```
S
   \ /
  DP VP
   \ /
  D NP V
  \ / \\
Three men smoke.
```

d. Question 3 [10 Points]
Please use the concept and notation for cardinality to write a lexical entry for the determiner *most*. (You don’t have to provide a truth-conditional derivation here, just the lexical entry.)

Notes:

- Don’t worry about the fact that the NPs that combine with *three* and *most* have to be plural. Just ignore the number morphology, and assume that \[ [[\text{man}]] = [[\text{men}]] \]

- Try to craft a lexical entry for *most* which will predict that “Most men smoke” is true iff more than half the men are smokers.
  (Note, these won’t be the literal truth-conditions you will derive, but they should end up being equivalent to this.)
Another Exercise on Presuppositions  [10 Points]

In this exercise, you’ll be working out a compositional semantics for the English word *only*. We’re going to focus on cases where *only* modifies a type e expression like a name, such as in sentences like the following:

a. \[ [\text{DP Only Barack}] [\text{VP smokes}] ].

b. \[ [\text{DP Only Joe}] [\text{VP dances}] ].

The first main observation about *only* in sentences like these is that a sentence of the form “Only DP VP” seems to presuppose that the sentence “DP VP” is true. For example:

c. “Only Barack smokes” presupposes that Barack smokes.

d. “Only Joe dances” presupposes that Joe dances.

e. **Question 1  [5 Points]**

Please review Section 2.1 of our first handout *The Conceptual Foundations of Truth-Conditional Semantics*. Please pay careful attention to the ‘test’ for whether something is a presupposition of a sentence S or not. Now, use that test to show that the statements in (c) and (d) are correct.

Bearing in mind the presuppositions just mentioned, a sentence of the form “Only DP VP” seems to assert that anything other than DP does not VP. That is, the sentences in (a) and (b) seem to have the following truth conditions:

f. \[ [[\text{Only Barack smokes}]] = T \text{ iff } \forall y, \text{ if } y \text{ is not Barack, then } y \text{ does not smoke.} \]

g. \[ [[\text{Only Joe dances}]] = T \text{ iff } \forall y, \text{ if } y \text{ is not Joe, then } y \text{ does not dance.} \]

f. **Question 2  [5 Points]**

Please provide a lexical entry for the word *only* which will predict:
(i) the truth-conditional statements in (f)-(g), and  
(ii) the presuppositions in (c) and (d)

For the purposes of this assignment, you need only give the lexical entry. You don’t have to provide a truth-conditional derivation.

**Huge Hint:** Consider the solution I reviewed in class for problem (7n) on the midterm!  
Consider the solution I reviewed in class for problem (2c) on Problem Set 5!

**Hugger Hint:** You should analyze DPs like “only Barack” as being type \(<e,t>, t\>