Problem Set on the Analysis of Quantification

The exercises below make reference to the handout "An Algebraic Approach to Quantification and Lambda Abstraction: Applications to the Analysis of English."

(1)   **Pronominal Binding in Our Fragment of English**

   a.   Please show how our English fragment in (55) and our translation base in (61) together predict that (i) receives a translation logically equivalent to (ii).

          (i)   *Michelle loves some man and he smokes.*

          (ii) $\exists x_0$ ((**man'** x_0) & (((**loves'** x_0) **michelle'**) & (**smokes'** x_0)))

   b.   Does the sentence below raise any problems for our system?

          (i)   *Michelle loves every man and he smokes.*

(2)   **Another Exercise in Indirect and Direct Interpretation**

   a.   Minimally alter our English fragment in (55) so that its expressions now include strings like *no man smokes* and *Michelle loves no man*.

   b.   Minimally alter our translation base in (61) so that strings like *no man smokes* receive appropriate translations in Politics+λ.

          <u>Note:</u> **For this exercise, you don't have to show that anything is a derived syntactic rule.**

   c.   Please show how the new translation base, along with the interpretation for Politics+λ presented in (53) of the handout *"Fregean Interpretations"* assign a meaning to the sentence *no man smokes*.

   d.   Given your proposed translation base, construct a direct interpretation of Mini-English+Qs.

(3)   **One Final Exercise on Direct Interpretation**

      a.   Minimally alter our English fragment in (55) so that its expressions now include strings like *most man smokes* and *Michelle loves most man*.

                  Note: For this exercise, please disregard the need for *most* in English to appear with a plural NP.

      b.   Provide a *direct* interpretation of the resulting fragment.

HINT:

For this problem, you should aim to predict that *most man smokes* has a meaning that maps a variable assignment g to 1 iff the set of men who smoke is larger than the set of men who don't smoke.

That is, it maps g to 1 iff: $| \{x : x \text{ in } D_{e,\,E} \ \& \ h(man)(g)(x) = 1 \ \& \ h(smoke)(g)(x) = 1 \}| \ >$
                                         $| \{x : x \text{ in } D_{e,\,E} \ \& \ h(man)(g)(x) = 1 \ \& \ h(smoke)(g)(x) = 0 \}|$

Fun Fact:

- There is no formula of Politics+λ that will have the meaning outlined above.

- Consequently, we cannot use Politics+λ to provide an *indirect* interpretation of the fragment in (3a).

- This highlights the way in which our ability to do *indirect* interpretation of natural language is limited by the logical languages we have at our disposal, **while there are no such limits on our ability to do *direct* interpretation…**