Q1.

In this question, you are asked to complete the missing parts in the derivation of the following sentence we did in class:

(1)   John killed Smith with a knife.

Remember that we integrated the past tense *-ed* into the analysis, as a function taking the Verb Phrase (VP) as argument.

Here is a derivation tree for the example. Your task is to fill in the missing slots X_n.

$\exists e.killing'e \wedge patient'es' \wedge (\exists x.knife'x \wedge instr'ex) \wedge agent'ej'$

John
j'

-ed
X_1

$\lambda e.killing'e \wedge patient'es' \wedge (\exists x.knife'x \wedge instr'ex)$

$\lambda e.killing'e \wedge patient'es'$

$\lambda q\lambda e.qe \wedge (\exists x.knife'x \wedge instr'ex)$

kill
$\lambda x\lambda e.killing'e \wedge patient'ex$

Smith
s'

with
X_2

$\lambda q.\exists x.knife'x \wedge qx$

a
$\lambda p\lambda q.\exists x.px \wedge qx$

knife
$\lambda x.knife'x$