## Practice

Give the full lambda computation of the following sentences, including tense. Hint: noun phrases don't have tense!

Computation solution

1. $[\![\textsc{pres}\text{ Wonderwoman see Cheetah}]\!]$

   (a) $[\![\text{see Cheetah}]\!]$

   $= [\![\text{see}]\!]([\![\text{Cheetah}]\!])$
   $= [\![\text{see}]\!](c)$
   $= \lambda x[\lambda y[\lambda t[SEE(y, x) \text{ at } t]]](c)$
   $= \lambda y[\lambda t[SEE(y, c) \text{ at } t]]$

   (b) $[\![\text{Wonderwoman see Cheetah}]\!]$

   $= [\![\text{see Cheetah}]\!]([\![\text{Wonderwoman}]\!])$
   $= [\![\text{see Cheetah}]\!](o)$
   $= \lambda y[\lambda t[SEE(y, c) \text{ at } t]](o)$
   $= \lambda t[SEE(o, c) \text{ at } t]$

   (c) $[\![\textsc{pres}\text{ Wonderwoman see Cheetah}]\!]$

   $= [\![\text{Wonderwoman see Cheetah}]\!]([\![\textsc{pres}]\!])$
   $= [\![\text{Wonderwoman see Cheetah}]\!](t^*)$
   $= \lambda t[SEE(o, c) \text{ at } t](t^*)$
   $= \text{T iff } SEE(o, c) \text{ at } t^*$

2. $[\![\textsc{past}\text{ Antman lift the crumb}]\!]$

   (a) $[\![\text{the crumb}]\!]$

   $= [\![\text{the}]\!]([\![\text{crumb}]\!])$
   $= \lambda f_{\langle e,t\rangle}[\iota x[f(x)]]([\![\text{crumb}]\!])$
   $= \iota x[[\![\text{crumb}]\!](x)]$
   $= \iota x[\lambda y[CRUMB(y)](x)]$
   $= \iota x[CRUMB(x)]$
   $= c$

   (b) $[\![\text{lift the crumb}]\!]$

   $= [\![\text{lift}]\!]([\![\text{the crumb}]\!])$
   $= [\![\text{lift}]\!](c)$
   $= \lambda x[\lambda y[\lambda t[LIFT(y, x) \text{ at } t]]](c)$
   $= \lambda y[\lambda t[LIFT(y, c) \text{ at } t]]$

   (c) $[\![\text{Antman lift the crumb}]\!]$

   $= [\![\text{lift the crumb}]\!]([\![\text{Antman}]\!])$
   $= [\![\text{lift the crumb}]\!](a)$
   $= \lambda y[\lambda t[LIFT(y, c) \text{ at } t]](a)$
   $= \lambda t[LIFT(a, c) \text{ at } t]$

(d) $[\![\textsc{past}$ Antman lift the crumb$]\!]$

$= [\![\textsc{past}]\!]([\![\text{Antman lift the crumb}]\!])$
$= \lambda f_{\langle i,t\rangle}[\exists t'[t' < t^* \ \& \ f(t')]]([\![\text{Antman lift the crumb}]\!])$
$= \exists t'[t' < t^* \ \& \ [\![\text{Antman lift the crumb}]\!](t')]$
$= \exists t'[t' < t^* \ \& \ \lambda t[LIFT(a,c) \text{ at } t](t')]$
$=$ T iff $\exists t'[t' < t^* \ \& \ LIFT(a,c) \text{ at } t']$

3. $[\![$Professor X will recruit the team$]\!]$

(a) $[\![$the team$]\!]$

$= [\![\text{the}]\!]([\![\text{team}]\!])$
$= \lambda f_{\langle e,t\rangle}[\iota x[f(x)]]([\![\text{team}]\!])$
$= \iota x[[\![\text{team}]\!](x)]$
$= \iota x[\lambda y[TEAM(y)](x)]$
$= \iota x[TEAM(x)]$
$= m$

(b) $[\![$recruit the team$]\!]$

$= [\![\text{recruit}]\!]([\![\text{the team}]\!])$
$= [\![\text{recruit}]\!](m)$
$= \lambda x[\lambda y[\lambda t[RECRUIT(y,x) \text{ at } t]]](m)$
$= \lambda y[\lambda t[RECRUIT(y,m) \text{ at } t]]$

(c) $[\![$Professor X recruit the team$]\!]$

$= [\![\text{recruit the team}]\!]([\![\text{Professor X}]\!])$
$= [\![\text{recruit the team}]\!](p)$
$= \lambda y[\lambda t[RECRUIT(y,m) \text{ at } t]](p)$
$= \lambda t[RECRUIT(p,m) \text{ at } t]$

(d) $[\![\textsc{fut}$ Professor X recruit the team$]\!]$

$= [\![\textsc{fut}]\!]([\![\text{Professor X recruit the team}]\!])$
$= \lambda f_{\langle i,t\rangle}[\exists t'[t' > t^* \ \& \ f(t')]]([\![\text{Professor X recruit the team}]\!])$
$= \exists t'[t' > t^* \ \& \ [\![\text{Professor X recruit the team}]\!](t')]$
$= \exists t'[t' > t^* \ \& \ \lambda t[RECRUIT(p,m) \text{ at } t](t')]$
$=$ T iff $\exists t'[t' > t^* \ \& \ RECRUIT(p,m) \text{ at } t']$