Q2 prove Rev_append' l1 l2 = Rev_append l1 l2

proof by structural induction on l1 (list)

Base case: $l_1 = [\,]$

1. rev_append' [] l2 $\xRightarrow{\text{by Rev\_append'}}$ append (rev []) l2 $\xRightarrow{\text{by rev}}$ append [] l2 $\xRightarrow{\text{by append}}$ l2

2. rev_append [] l2 $\xRightarrow{\text{by rev\_append}}$ l2]

property holds for base case l1 = []

Case: l1 = h::t

IH: rev_append' t l2 = rev_append t l2 ; assumtion

rev_append' l1 l2 $\xRightarrow{\text{by rev\_append'}}$ append (rev l1) l2 $\xRightarrow{\text{by rev}}$ append ((rev t)@[h]) l2

$\xRightarrow{\text{by append}}$ (rev t)@[h]@ l2 $\xRightarrow{\text{for single element @}\Leftrightarrow\text{::}}$ rev t@(h::l2) $\xRightarrow{\text{by def of append}}$ append (rev t) h::l2

$\xRightarrow{\text{by def rev\_append'}}$ rev_append' t (h::l2) $\xRightarrow{\text{IH}}$ rev_append t (h::l2)

$\xRightarrow{\text{by def rev\_append (goingback)}}$ rev_append (h::t) l2 $\xRightarrow{\text{def of l1}}$ rev-append l1 l2 ■