

1: $(\text{rev} \cdot \text{rev})x = \text{rev}(\text{rev } x)$	Unfold \cdot
2: $\text{rev}(\text{rev}[]) = \text{rev}[]$	Unfold $\text{rev}'0$
3: $\text{rev}[] = []$	Unfold $\text{rev}'0$
4: $[] = []$	= reflexive
5: $\text{rev}[] = []$	= transitive 3,4
6: $\text{rev}(\text{rev}[]) = []$	= transitive 2,5
7: $\text{rev}(\text{rev}[x3]) = \text{rev}[x3]$	Unfold $\text{rev}'1$
8: $\text{rev}[x3] = [x3]$	Unfold $\text{rev}'1$
9: $[x3] = [x3]$	= reflexive
10: $\text{rev}[x3] = [x3]$	= transitive 8,9
11: $\text{rev}(\text{rev}[x3]) = [x3]$	= transitive 7,10
12: $\text{rev}(\text{rev } xs) = xs, \text{rev}(\text{rev } ys) = ys$	assumptions
13: $\text{rev}(\text{rev}(xs ++ ys)) = \text{rev}(\text{rev } ys ++ \text{rev } xs)$	Unfold $\text{rev}'2$
14: $\text{rev}(\text{rev } ys ++ \text{rev } xs) = \text{rev}(\text{rev } xs) ++ \text{rev}(\text{rev } ys)$	Unfold $\text{rev}'2$
15: $\text{rev}(\text{rev } xs) ++ \text{rev}(\text{rev } ys) = xs ++ \text{rev}(\text{rev } ys)$	Unfold 12.1
16: $xs ++ \text{rev}(\text{rev } ys) = xs ++ ys$	Unfold 12.2
17: $xs ++ ys = xs ++ ys$	= reflexive
18: $xs ++ \text{rev}(\text{rev } ys) = xs ++ ys$	= transitive 16,17
19: $\text{rev}(\text{rev } xs) ++ \text{rev}(\text{rev } ys) = xs ++ ys$	= transitive 15,18
20: $\text{rev}(\text{rev } ys ++ \text{rev } xs) = xs ++ ys$	= transitive 14,19
21: $\text{rev}(\text{rev}(xs ++ ys)) = xs ++ ys$	= transitive 13,20
22: $\text{rev}(\text{rev } x) = x$	listinduction 6,11,12–21
23: $x = \text{id } x$	Fold id
24: $\text{rev}(\text{rev } x) = \text{id } x$	= transitive 22,23
25: $(\text{rev} \cdot \text{rev})x = \text{id } x$	= transitive 1,24
26: $\text{rev} \cdot \text{rev} = \text{id}$	ext 25