$\frac{\text{Proof:}}{\text{(O ((Curry Map) f) ((Curry Map) g))}} = ((curry Map) (O f g))$

Case #1: Null case given x = '() ((O ((cury map) +) ((cury map)g)) >) = { by substitution } ((O ((cary nap) +) ((cury nap)g)) '()) = { apply - compose 3 (((curry Map) of ((curry Map) g)'()) = {apply- curry} ((curry nap) f) (mup g (1)))) = {apply-curry} (Map + (Map g '())) = { Map - nil} = { MAP-1:13 (Map (0 f g) '(1) = \$ substitution (map (o · f y) x) = { apply-corry} ((corry Map) LO f 9))x)

```
Lase #2: Injudice Case
Inductive hypothesis:
  \overline{(O((Curry Map) f)((Curry Map) g))} \times = \overline{(((Curry Map) (O f g))} \times 
 holds true for all x of the form (cons a as)
 therefore, by substitution:
((Curry map) f) ((Curry map) g)) (coas a os))
= (((cury rup) (0 fg)) ((ons a as)) holds free for
  all a, as.
((Curry Map) f) ((Curry Map) g)) x)
= { Bx assumption}
((Curry Map) f) ((Curry Map) g)) (cons a as)
= { apply - comgose3
 (( (curry Map) of ((curry Map) g) (cons ce as))
= {apply-curry}
 ((curry nap) f) (mup g (cons ~ as)))
= {apply-corry}
  (Map + (Map g (cons a as)))
= 3 Map-cons }
 (Map + (Gons (g a) (Map g us)))
= { Map-cons }
 ((ons (+ (9 a)) (Map + (Map g as)))
={apply - comprse}
(cons (o & g)a) (MAP & (((corry nap) g) as))
= fapply-curryz
```

((OAS [10 f g)a) (((curry MAP) f) (((corry MAP) g) as))

= {inductive Mypothesis, because as is of the form (can b bs)}

((OAS [10 f g)a) (((curry Map) (0 f g) as))

= {OAPH-CURRY }

((OAS (LO f g) a) (MAP (0 f g) as))

= {MAP-COAS}

(MAP (O f g) (CANS (A AS))

= {APPH-curry}

((Curry MAP) (0 f g)) (cons a as))

Therefore, our judicitive hypothesis holds for all X.