CS421 HW02
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Problem 1.
(1)

1. ρ_1 = {z → 4, y → 2, plus_x → <y → x+y, {x->2}>, x → 2}
   (* So, plus_x n = n+2 *)
2. ρ_2 = {y → 0, sub_z → <x → y-z+x, ρ_1>, z → 4, plus_x → <y → x+y, {x->2}>, x → 2}
   (* So, sub_z n = n-2 *)
3. ρ_3 = {f_z → <x → if(plus_x x < z) then plus_x z else sub_z x, ρ_2>,ρ_2}
   (* So, f_z n = if(n+2<4) then 6, else n-2 *)

(2) First, ρ_3 = {f_z → <x → if(plus_x x < z) then plus_z else sub_z x, ρ_2>,ρ_2}
Eval (f_z y, ρ_3) =
Eval ((app <x → if(plus_x x < z) then plus_z else sub_z x, ρ_2>) y, ρ_2) =
Eval ((app <x → if(plus_x x < z) then plus_z else sub_z x, ρ_2>) 0, ρ_2) =
Eval (if(plus_x x < z) then plus_x z else sub_z x,{y → 0}+ρ_2) =
Eval (if(plus_x 0 < z) then plus_x z else sub_z 0, ρ_2) =
Eval (if(<y → x+y, {x->2}>0 < z) then <y → x+y, {x->2}> z else <x → y-z+x, ρ_1> 0 , ρ_2) =
Eval (if (2 < 4) then <y → x+y, {x->2}> 4 else <x → y-z+x, ρ_1> 0 , ρ_2) =
Eval <y → x+y, {x->2}> 4 = 6