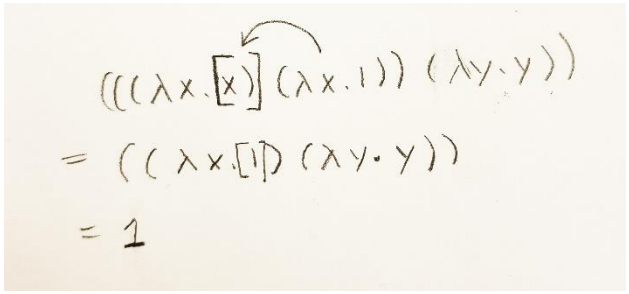
1.

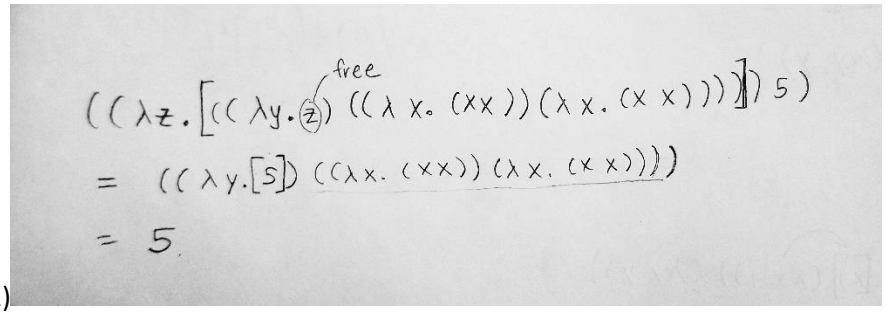
((lambda(x)

((lambda(y)

((lambda(z) e) v3)) v2)) v1)

2.

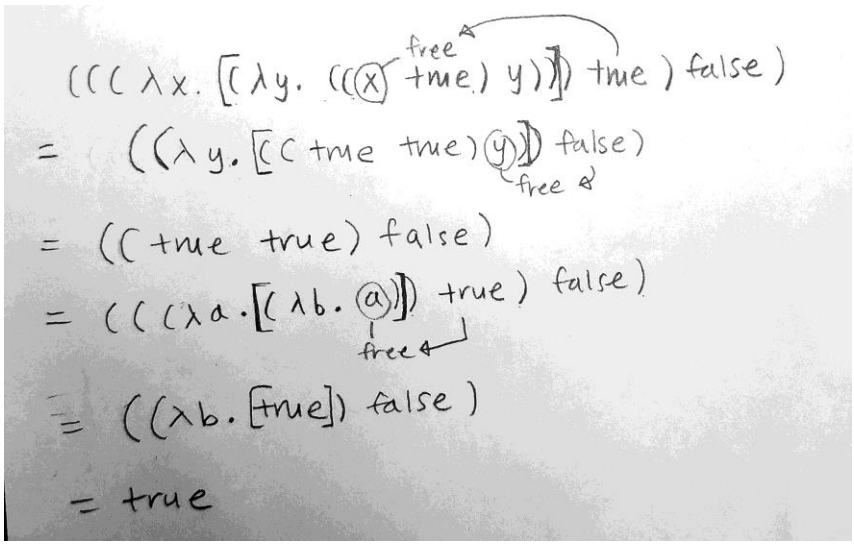
1) 

2) 

For 1), it does not have other orders to apply beta reduction

However, for 2) if we choose to apply beta reduction on ((λx. (x x))(λx. (x x))) first, it will never end because it will give same one(which is ((λx. (x x))(λx. (x x)))) after do beta reduction.

3.

1) 

2) XOR = (λx. λy. ((x ((y false) true)) y))

x	y	(λx. λy. (x ((y false) true) y))
true	True	((true ((true false) true)) true) = ((true false) true) = **false** (✓)
True	False	((true ((false false) true)) false) = ((true true) false) = **true** (✓)
False	True	((false ((true false) true)) true) = ((false false) true) = **true** (✓)
false	false	((false ((false false) true)) false) = ((false true) false) = **false** (✓)

4.

((S K) K)

= (((λxyz. ((x z) (y z)))(λxy.x)) K)

= ((λyz.((λxy.x) z) (y z)))K)

= ((λyz.((λy.z) (y z))) K)

= ((λyz.z) K)

= (λz.z)

= I