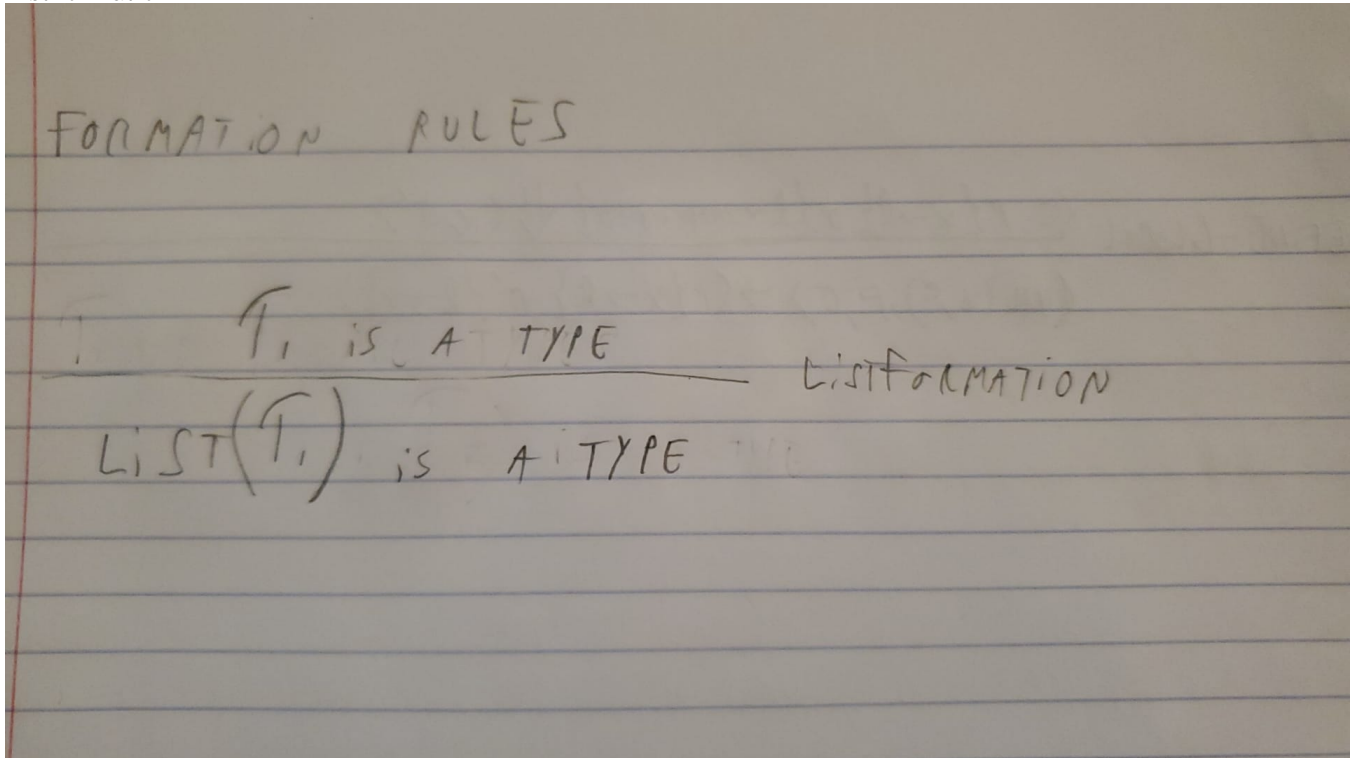


Exercise 4

Formation rules:

ListFormation:



Introduction rules:

Cons:

$$\frac{\Gamma \vdash e_1 : \tau \quad \Gamma \vdash e_2 : \text{List}(\tau)}{\Gamma \vdash \text{cons}(e_1, e_2) : \text{List}(\tau)} \quad \text{LIST CONS}$$

Empty list:

$$\frac{}{\Gamma \vdash \text{EMPTYLIST}(\tau) : \text{List}(\tau)} \quad \text{EMPTYLIST}$$

Elimination rules:

Car:

$$\frac{\Gamma \vdash e : \text{LIST}(\tau_1)}{\Gamma \vdash \text{CAR}(e) : \tau_1} \quad \text{LIST CAR}$$

Cdr:

$$\frac{\Gamma \vdash e : \text{LIST}(\tau_1)}{\Gamma \vdash \text{CDR}(e) : \text{LIST}(\tau_1)} \quad \text{LIST CDR}$$

Check to see if list is empty (null?):

