Question 1.1.1:

a) $[T_1 * [T_1 \to T_2]] \to N$, $[[T_3 \to T_4] * [T_5 \to Number]] \to N]$

$S = \{T_1 = [T_3 \to T_4],\ T_5 = [T_3 \to T_4],\ T_2 = Number\}$

b) $[T_1 * [T_1 \to T_2]] \to N$, $[Number * [Symbol \to T_4]] \to N]$

No MGU exists

c) $T_1, T_2$

$S = \{T_1 = T_2\}$

d) Boolean, Boolean

$S = \{\}$

Question 1.1.2:

a) $\{s: [T_2 \to T_3],\ g: [T_1 \to T_2],\ a: Boolean\} \vdash (s\ (g\ a)): T_3$

For $s = \{T_1 := Boolean\}$:

1) $\{s: [T_2 \to T_3],\ g: [Boolean \to T_2],\ a: Boolean\} \vdash (s\ (g\ a)): T_3$
2) $T_3$ is not more specific than $T_3$

Therefore the typing statement is True.

b) $\{s: [T_2 \to T_1],\ x: T_1,\ y: T_3\} \vdash (s\ x): T_1$

For $s = \{T_2 := T_1\}$:

1) $\{s: [T_1 \to T_1],\ x: T_1,\ y: T_3\} \vdash (s\ x): T_1$
2) $T_1$ is not more specific than $T_1$

Therefore the typing statement is True.

Question 1.2:

```
(LS
   (define f (lambda (x:T1) (x))
   (define a:T1 1)
   (define b:T3 2)
   (define c:T4 2)
   (define d:T5 4)
   (f a)
   (f b)
   (f c)
   (f d)
)
```