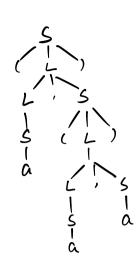
3.1a



S-2-1, S-2, S-a

S-2-1, S-2, S-a

S-2-1, S-2, S-a

S-2-1, S-2

S-2

3.10

$$\begin{array}{l} (\alpha,\alpha) \Rightarrow (\alpha,(\alpha,\alpha)) \\ \alpha \Rightarrow (\alpha,\alpha) \Rightarrow (\alpha,(\alpha,\alpha)) \Rightarrow (\alpha,(\alpha,(\alpha,\alpha))) \Rightarrow (\alpha,((\alpha,\alpha),(\alpha,\alpha))) \end{array}$$

3.2

(a)
$$S \Rightarrow asbs \Rightarrow asbs \Rightarrow asbasbs \Rightarrow asbasbs \Rightarrow asbasbs = asbasbs = abab
 $S \Rightarrow asbs \Rightarrow absasbs \Rightarrow absasbs \Rightarrow absasbs \Rightarrow absasbs = abab$$$

(b) S= asbs = asbasbs => asbasbs => asbasbs => asbasbs

3.3

$$S \Rightarrow S \text{ and } S^{+}|S^{+}$$
 $S^{+} \Rightarrow S^{+} \text{ or } T|T$
 $T \Rightarrow \text{ not } T^{+}|T^{+}$
 $T^{+} \Rightarrow \text{ true } |\text{ false }|(S)$