

8) *Lösung.*

$$\frac{\frac{\frac{\frac{0+x = x \in E}{E \vdash 0+x = x} \quad e, \sigma_2}{E \vdash 0 + s(0) = s(0)} \quad f)}{E \vdash s(0) + s(0) = s(0 + s(0))} \quad e), \sigma_1}{\frac{E \vdash s(0) + s(0) = s(s(0))}{E \vdash s(s(0) + s(0)) = s(s(s(0)))} \quad f)}$$

Wobei $\sigma_1 := \{x \mapsto 0, y \mapsto s(0)\}$ und $\sigma_2 := x \mapsto s(0)\}$. □

9) *Lösung.* **a)** $G = (\{S, B\}, \{a, b\}, R, S)$ mit den Regeln R :

$$\begin{aligned} S &\rightarrow aS \mid bB \\ B &\rightarrow aB \mid bS \mid \epsilon \end{aligned}$$

b) $\underline{S} \Rightarrow \underline{bS} \Rightarrow \underline{bSb} \Rightarrow baa$ □

10) *Lösung.*

```
while  $x_2 \neq 0$  do
   $x_2 := x_2 - 1$ 
end;
 $x_2 := x_2 + 1$ ;
while  $x_3 \neq 0$  do
   $x_3 := x_3 - 1$ 
end;
 $x_3 := x_3 + 1$ ;
 $x_3 := x_3 + 1$ ;
while  $x_1 \neq 0$  do
   $P_{\times}(x_2, x_3, x_4, x_5, x_6)$ ;
   $x_1 := x_1 - 1$ 
end
```

□

