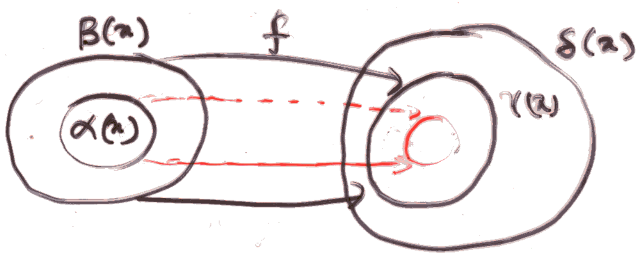
Inference rule for assignment (contd.)

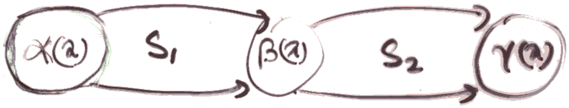
(ii)

$$\frac{\alpha(x) \to \beta(x) \qquad \beta(x)\ \{S\}\ \gamma(x) \qquad \gamma(x) \to \delta(x)}{\alpha(x)\ \{S\}\ \delta(x)}$$



(iii) **Inference rule for seq. of statements:**

$$\frac{\alpha(x)\ \{S_1\}\ \beta(x) \qquad \beta(x)\ \{S_2\}\ \gamma(x)}{\alpha(x)\ \{S_1 ; S_2\}\ \gamma(x)}$$



Example: $S_1 \equiv x \Leftarrow x+1$; $S_2 \equiv y \Leftarrow y+1$

post to pre

$$\frac{[x+1=y+1]\ \{S_1\}\ [x=y+1] \qquad [x=y+1]\ \{S_2\}\ [x=y]}{[x+1=y+1]\ \{S_1 ; S_2\}\ [x=y]} \equiv [x=y]\ \{S_1; S_2\}\ [x=y].$$

Alternatively, (pre to post)

$$\frac{[x=y]\ \{S_1\}\ [x-1=y] \qquad [x-1=y]\ \{S_2\}\ [x-1=y-1]}{[x=y]\ \{S_1 ; S_2\}\ [x-1=y-1]} \equiv [x=y]\ \{S_1; S_2\}\ [x=y]$$

(iv) **Inference rule for if-then-else**

(post-to-pre form)

$$\frac{\qquad}{\underbrace{[B(x) \wedge \alpha(f_1(x))] \vee [\neg B(x) \wedge \alpha(f_2(x))]}_{\text{weakest precond.}}\ \{\text{if } B(x) \text{ then } S_1 \text{ else } S_2\}\ \alpha(x)}$$