2011-04-07

Note Title 2011-04-07

Ex 86 Schöning

Every barber shaves all persons who do not shave themselves.

$$\forall x \forall y \left((\neg Shaves(x,x) \wedge IsBarber(y)) \Rightarrow Shaves(y,x) \right)$$

$$\forall x \forall y \left(\neg [\neg Shaves(x,x) \wedge IsBarber(y)) \vee Shaves(y,x) \right)$$

$$\forall x \forall y \left(Shaves(x,x) \vee \neg IsBarber(y) \vee Shaves(y,x) \right)$$

(a) $\{ Shaves(x,x),\ \neg IsBarber(y),\ Shaves(y,x) \}$

[Mr. Stiffler:] $\forall x \left(B(x) \Rightarrow \forall y \left(\neg S(y,y) \Rightarrow S(x,y) \right) \right)$

⋮

(a) again

No barber shaves every person who shaves himself.

$$\forall x \left(Shaves(x,x) \Rightarrow \neg \exists y \left(IsBarber(y) \wedge Shaves(y,x) \right) \right)$$

$$\forall x \left(\neg Shaves(x,x) \vee \neg \exists y \left(IsBarber(y) \wedge Shaves(y,x) \right) \right)$$

$$\forall x \left(\neg Shaves(x,x) \vee \forall y \neg \left(IsBarber(y) \wedge Shaves(y,x) \right) \right)$$

$\forall x \forall y \left(\neg \text{Shaves}(x,x) \vee \neg \text{Is Barber}(y) \vee \neg \text{Shaves}(y,x) \right)$

(b) $\{ \neg \text{Shaves}(x,x),\ \neg \text{Is Barber}(y),\ \neg \text{Shaves}(y,x) \}$

[Stiffler / Dio:] $\sim \exists x \exists y \left[B(x) \wedge S(y,y) \wedge S(x,y) \right]$

(b)

[Stiffler] $\forall x \forall \left(B(x) \Rightarrow \left(S(y,y) \rightarrow \neg S(x,y) \right) \right)$

(b)

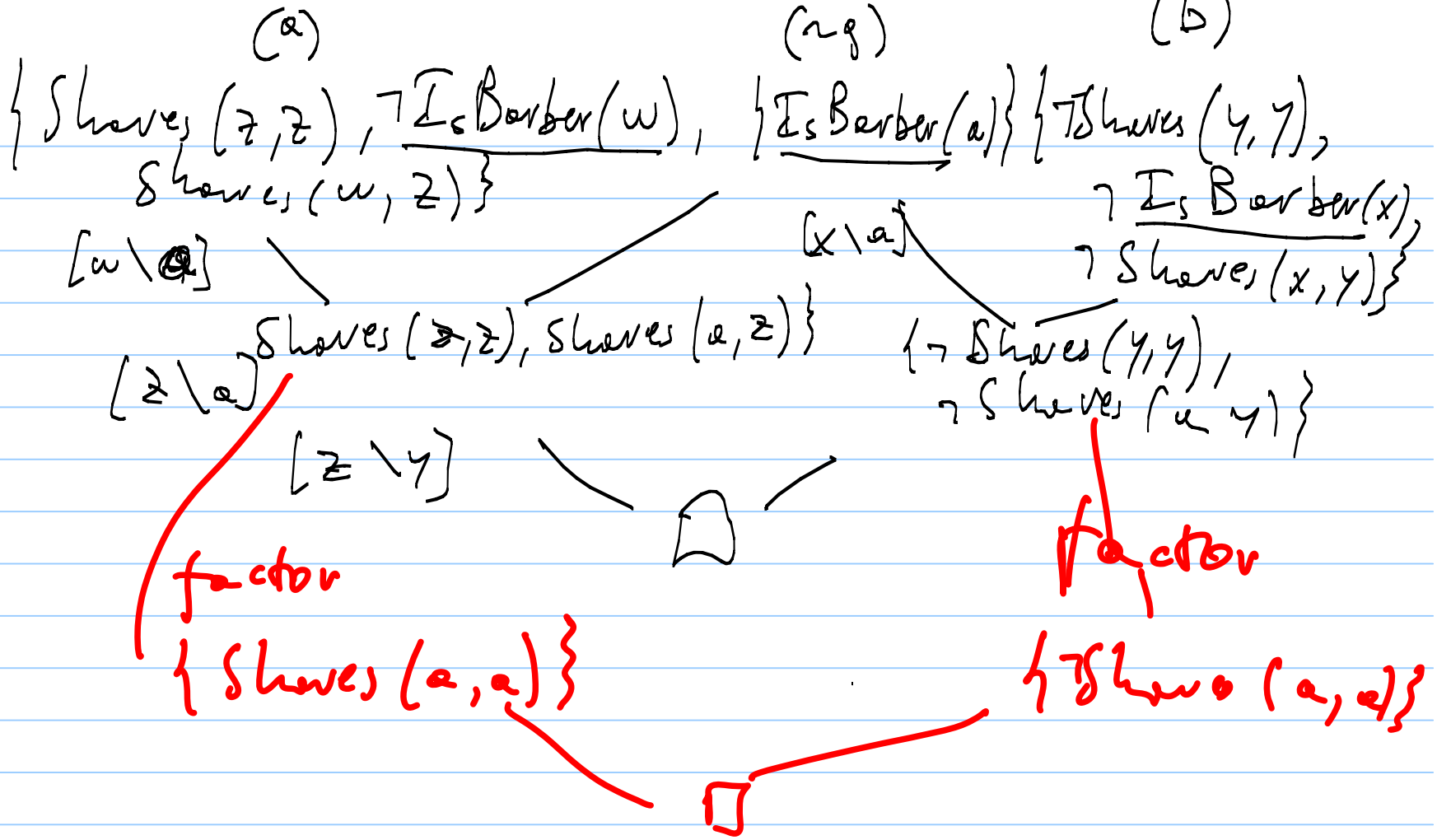
(8) There are no barbers

$$\forall x \neg \text{IsBarber}(x)$$

(~8) $\neg \forall x \neg \text{IsBarber}(x)$

$$\exists x \, \text{IsBarber}(x)$$

(~8) $\text{IsBarber}(a)$


(a)
(¬q)
(b)
{Shaves(z,z), ¬IsBarber(w), Shaves(w,z)}
{IsBarber(a)}
{¬Shaves(y,y), ¬IsBarber(x), ¬Shaves(x,y)}
[w\a]
[x\a]
{Shaves(z,z), Shaves(a,z)}
{¬Shaves(y,y), ¬Shaves(a,y)}
[z\a]
[z\y]
factor
factor
{Shaves(a,a)}
{¬Shaves(a,a)}