

Ex I. (2023). e)

$$F(x) = p(x) \wedge \underline{\neg \exists Y: (q(Y) \wedge \neg r(x, Y))}$$

COMPLIANT

$$\Leftrightarrow p(x) \wedge \forall Y (\neg q(Y) \vee r(x, Y))$$

$$\stackrel{\pi[\sigma_1](\tau)}{\Leftrightarrow} p(x) \wedge \forall Y (\underline{q(Y) \rightarrow r(x, Y)})$$

$\hat{=}$ relational division, $\tau \div q$

$$\frac{A \overset{r}{\parallel} B}{A} \quad \frac{q}{A} \Rightarrow \frac{r \div q}{B} \stackrel{p \div (\neg p)}{\pi[\sigma_1](\tau)}$$

$\hat{=}$ all B that occur with each $a \in q$ in τ

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$$F(x) = \underline{p(x)} \wedge \neg \exists Y: (\underline{q(Y)} \wedge \neg \underline{r(x, Y)})$$

SRNF:

$\tau = \{x\} = \text{free}(F) \quad \checkmark$

$\tau = \emptyset$

$\tau = \{y\}$

$\tau = \emptyset$

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Chapter 9

before $M \models \forall c: \text{cont}(C) \rightarrow \exists y: \text{op}(x, y)$
 $M \models \text{capital}(D, \text{Berlin})$
 $\mathcal{S} \models \text{F}$

"F holds in ^{interpretation} State \mathcal{S} "
 $\text{Spec} \models \forall x, y: f(\dots)$
 $\text{F} \models \mathcal{Q}$

"F entails \mathcal{Q} "
 Whenever F holds, then \mathcal{Q} holds
 in any state

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478:

FOL:
 $\forall x: \text{TopMgr}(x) \rightarrow \exists d: (\text{mgs}(u, d) \wedge \exists d_1, d_2: (\text{mgs}(u, d_1) \wedge \text{mgs}(u, d_2) \rightarrow d_1 = d_2))$

DL:
 $\text{TopMgr} \sqsubseteq \exists \text{mgs}. \text{Dept}$

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