

Uitwerkingen Practicumwerkgroepopgaven

Hoofdstuk 8

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8.1.d. $\forall x(Px \wedge Qx) \vdash \forall xPx \wedge \forall xQx$

$$\frac{\frac{\frac{\forall x(Px \wedge Qx)}{Py \wedge Qy} \forall E}{Py} \wedge E}{\forall xPx} \forall I \quad \frac{\frac{\frac{\forall x(Px \wedge Qx)}{Py \wedge Qy} \forall E}{Qy} \wedge E}{\forall xQx} \forall I}{\forall xPx \wedge \forall xQx} \wedge I$$

8.1.e. $\forall xPx \wedge \forall xQx \vdash \forall x(Px \wedge Qx)$

$$\frac{\frac{\frac{\forall xPx \wedge \forall xQx}{\forall xPx} \wedge E}{Py} \forall E}{Py \wedge Qy} \wedge I \quad \frac{\frac{\frac{\forall xPx \wedge \forall xQx}{\forall xQx} \wedge E}{Qy} \forall E}{Py \wedge Qy} \wedge I}{\forall x(Px \wedge Qx)} \forall I$$

8.1.f. $\forall xPx \vee \forall xQx \vdash \forall x(Px \vee Qx)$

$$\frac{\frac{\frac{\forall xPx \vee \forall xQx}{[\forall xPx]^1} \forall E}{Py \vee Qy} \forall I \quad \frac{\frac{\frac{\forall xPx \vee \forall xQx}{[\forall xQx]^1} \forall E}{Py \vee Qy} \forall I}{Py \vee Qy} \forall E, 1}{\forall x(Px \vee Qx)} \forall I$$

8.1.j. $\forall x(Px \wedge Qx) \vdash \exists xPx \wedge \exists xQx$

$$\frac{\frac{\frac{\forall x(Px \wedge Qx)}{Px \wedge Qy} \forall E}{Py} \wedge E}{\exists xPx} \exists I \quad \frac{\frac{\frac{\forall x(Px \wedge Qx)}{Py \wedge Qy} \forall E}{Qy} \wedge E}{\exists xQx} \exists I}{\exists xPx \wedge \exists xQx} \wedge I$$

8.1.k. $\forall x\forall yRxy \vdash \forall y\forall xRyx$

$$\frac{\frac{\frac{\forall x\forall yRxy}{\forall yRzy} \forall E}{Rzu} \forall E}{\forall xRzx} \forall I}{\forall y\forall xRyx} \forall I$$

8.1.l. $\forall y\forall xRxy \vdash \forall x\forall yRxy$

$$\frac{\frac{\frac{\forall x\forall yRxy}{\forall yRzy} \forall E}{Rzu} \forall E}{\forall xRzu} \forall I}{\forall y\forall xRxy} \forall I$$

8.1.m. $\vdash \forall xPx \rightarrow \forall yPy$

$$\frac{\frac{\frac{[\forall xPx]^1}{Py} \forall E}{\forall yPy} \forall I}{\forall xPx \rightarrow \forall yPy} \rightarrow I, 1$$

8.1.o. $\forall xPx \vdash \exists xPx$

$$\frac{\frac{\forall xPx}{Py} \forall E}{\exists xPx} \exists I$$

8.1.p. $\vdash P \rightarrow \forall xP$

$$\frac{\frac{[P]^1}{\forall xP} \forall I}{P \rightarrow \forall xP} \rightarrow I, 1$$