

Atividade 2: Prove o seguinte $\vdash \neg\neg(\varphi \vee \neg\varphi)$ na lógica proposicional minimal.

$$\frac{\frac{\frac{[\neg(\varphi \vee \neg\varphi)]^u}{\perp} \text{ (i) } \sigma}{\neg\varphi} \text{ (i) } \sigma}{\neg\neg(\varphi \vee \neg\varphi)} \text{ (i) } \sigma$$

$$\frac{\frac{\frac{\frac{\frac{\varphi \vdash \varphi \text{ (Ax)}}{\varphi \vdash \varphi \vee \neg\varphi} \text{ (vi)}}{\neg(\varphi \vee \neg\varphi) \vdash \neg(\varphi \vee \neg\varphi)} \text{ (Ax)}}{\neg(\varphi \vee \neg\varphi), \varphi \vdash \perp} \text{ (ri)}}{\neg(\varphi \vee \neg\varphi) \vdash \neg\varphi} \text{ (vi)}}{\neg(\varphi \vee \neg\varphi) \vdash \varphi \vee \neg\varphi} \text{ (ve)}}{\neg(\varphi \vee \neg\varphi) \vdash \perp} \text{ (ri)}}{\vdash \neg\neg(\varphi \vee \neg\varphi)} \text{ (ri)}$$

$$\frac{\frac{\frac{[\varphi]^u}{\varphi \vee \neg\varphi} \text{ (vi)}}{[\neg(\varphi \vee \neg\varphi)]^v} \text{ (ve)}}{\perp} \text{ (ri) } \sigma}{\neg\varphi} \text{ (ri) } \sigma} \quad \frac{\frac{[\neg\varphi]^w}{\varphi \vee \neg\varphi} \text{ (vi)}}{[\neg(\varphi \vee \neg\varphi)]^v} \text{ (ve)}}{\perp} \text{ (ri) } \sigma}{\neg\neg\varphi} \text{ (ve)}$$

$$\frac{\perp}{\neg\neg(\varphi \vee \neg\varphi)} \text{ (ri) } \sigma$$

$$\frac{\frac{\frac{\frac{\frac{\varphi \vdash \varphi \text{ (Ax)}}{\varphi \vdash \varphi \vee \neg\varphi} \text{ (vi)}}{\neg(\varphi \vee \neg\varphi) \vdash \neg(\varphi \vee \neg\varphi)} \text{ (Ax)}}{\neg(\varphi \vee \neg\varphi), \varphi \vdash \perp} \text{ (ri)}}{\neg(\varphi \vee \neg\varphi) \vdash \neg\varphi} \text{ (vi)}}{\neg(\varphi \vee \neg\varphi) \vdash \varphi \vee \neg\varphi} \text{ (ve)}}{\neg(\varphi \vee \neg\varphi) \vdash \perp} \text{ (ri)}}{\vdash \neg\neg(\varphi \vee \neg\varphi)} \text{ (ri)}$$