

# Lógica Computacional

LEI, 2014/2015

DI-UBI

Aula Prática 21

Leis da Lógica de Primeira Ordem

Prove as seguintes afirmações.

1.  $\{\exists x (\varphi \wedge \psi)\} \models \exists x \varphi \wedge \exists x \psi$
2.  $\{\forall x \varphi \wedge \forall x \psi\} \models \forall x (\varphi \wedge \psi)$
3.  $\{\exists x \varphi \vee \exists x \psi\} \models \exists x (\varphi \vee \psi)$
4.  $\{\exists x \neg \varphi\} \models \neg \forall x \varphi$
5.  $\{\forall x \neg \varphi\} \models \neg \exists x \varphi$
6.  $\forall x \varphi \equiv \neg \exists x \neg \varphi$
7.  $\forall x \varphi \vee \psi \equiv \forall x (\varphi \vee \psi)$ , se  $x \notin \text{VL}(\psi)$
8.  $\exists x \varphi \vee \psi \equiv \exists x (\varphi \vee \psi)$ , se  $x \notin \text{VL}(\psi)$
9.  $\exists x (\psi \rightarrow \varphi) \equiv \psi \rightarrow \exists x \varphi$ , se  $x \notin \text{VL}(\psi)$
10.  $\exists x (\varphi \rightarrow \psi) \equiv \forall x \varphi \rightarrow \psi$ , se  $x \notin \text{VL}(\psi)$