

HOMEWORK 7
Due Thursday, November 10

1. Verify that the following syllogisms are valid by giving deductions.
 - (a) All Greeks are mortal.
Some Greeks are women.
Therefore, some women are mortal.
 - (b) No Greeks are slaves.
Some slaves are women.
Therefore, some women are not Greek.
2. On page 95, do problem 1(i); on page 99, do problems 6 and 7; and on page 102, do problems 3 and 4.
3. Prove $\neg\exists x\neg\varphi(x) \leftrightarrow \forall x\varphi(x)$.
4. Taking only the introduction and elimination rules for the existential quantifier as given, derive the corresponding rules for the universal quantifier (in the way done in Lemma 2.9.1 of van Dalen). Be sure to take account of the side conditions on the rules.
5. Suppose the formula ψ has no free x . Show that $\forall x\varphi(x) \rightarrow \psi \vdash \forall x(\varphi(x) \rightarrow \psi)$ is *not* provable.
- ★ 6. Do problem 7 on page 102.