Boolos and Jeffrey - HW6

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1 The story so far...

We've previously established via the *Church-Turing thesis* that there cannot be a decision procedure for validity. This means there cannot be **both** a positive test and a negative test for validity. At this point in the book it is revealed that there is in fact a positive test for validity. A proof of this fact will have to show the implication in both directions. The first implication that *If the test says "yes", the formula is valid.* is known as *Soundness*. The second implication that *If the formula is valid, the test says "yes".* is known as *Completeness*. Chapter 11 presents a proof of Soundness for the positive validity test.

2 a few refutations

2.1

argument: $\{\exists x(Fx \wedge Gx), \forall x(Gx \rightarrow \neg Hx)\} \vdash \exists x[x = x \wedge (Fx \wedge \neg Hx)]$

$\Delta : \{\}$

refutation of Δ :

2.2

argument: $\{\exists xLbx \rightarrow \forall xLxb, \neg Lbb\} \vdash \neg Lba$

$\Delta : \{\}$

refutation of Δ :

2.3

argument: $\{\exists y(Gy \wedge \forall zKyz), \forall y(Fy \rightarrow \neg \forall zKyz)\} \vdash \exists y(Gy \wedge \neg Fy)$

$\Delta : \{\}$

refutation of Δ :