

Logic I
Fall 2009
Problem Set 7

1. Provide your own examples (not the ones given in TLB) of each of the following:
 - (a) A sentence of PL that is quantificationally true
 - (b) A sentence of PL that is quantificationally false
 - (c) A pair of distinct sentences of PL that are quantificationally equivalent
 - (d) A pair that are quantificationally inconsistent
 - (e) A set Γ of PL sentences and a PL sentence not in Γ that is quantificationally entailed by Γ

2. On pg. 351 of TLB, the authors provide a list of quantificationally equivalent pairs of sentences. For instance, where \mathbf{Ax} is a formula containing \mathbf{x} , (a) is equivalent to (b) *on the condition that \mathbf{x} does not occur in \mathbf{P}* .
 - (a) $(\exists \mathbf{x})\mathbf{Ax} \supset \mathbf{P}$
 - (b) $(\forall \mathbf{x})(\mathbf{Ax} \supset \mathbf{P})$,(Note that the main logical operator of (a) is the horseshoe, not the quantifier.) The italicized restriction is essential. To demonstrate this, drop the restriction and provide a sentence of the form in (a) or the form in (b) such that there is not an equivalent sentence of the other form. Explain why there isn't.

3. Complete problems 7.8E 2c, h, i, and n. Indicate the main logical operator of each symbolization.

4. Complete problems 7.8E 5h, a, n, and r. Make the translations natural in English — no 'x's or 'y's allowed!

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