

Ma125: Mathematical Logic

3rd homework set, due at 2:25pm on Wednesday, October 2nd.

Bring your solutions to class, or slide them under the door of 513 Van Vleck.

1. Let S be a language with a unary function symbol $+$, a binary function symbol 1 , and a 17-ary relation symbol $<$. Give an example of an S -structure with an infinite universe.
2. Let S be the language of rings: two binary function symbols $+$ and \cdot , a unary function symbol $-$, and two constant symbols 0 and 1 . How many S -structures with universe $\{1, 2, a, X\}$ are there?
3. Let S be a language, x a variable, and τ an S -term. Prove or refute the following.
 - (a) If t is another S -term, and t' is the expression obtained by replacing every instance of x in t with τ , then t' is also an S -term.
 - (b) If α is an S -formula, and β is the expression obtained by replacing every instance of x in α with τ , then β is also an S -formula.
4. Do exercises 2.1.1, 2.1.7, and 2.1.10 in Enderton
5. Do exercises 2.2.9 and 2.2.11 in Enderton