5.2-5.5 Questions

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1 5.2

I didn't mark any questions for section 5.2.

2 5.3

p. 120 This is more of a comment, but $N \vdash \ \forall y[\phi(\overline{a}, y) \leftrightarrow y = \overline{b}]$ seems to me a bit reminiscent of well-definedness for functions. If N provides a deduction for $\phi(\overline{a}, y)$ for some $\mathcal{L}_{NT}$-term $\overline{a}$ and some y, then y must also be some $\mathcal{L}_{NT}$-term $\overline{b}$. Otherwise, the formula $\phi(\overline{a}, y)$ isn't really saying anything, much in the same way that a function that isn't well-defined can be somewhat nonsensical. (right?)

p.120 In Definitions 5.3.1 through 5.3.4, they say representable **(in N)**, but they don't do this through the rest of the chapter. I'm assuming that's because they implicitly mean "in N" wherever it might be implied, but might it be because we could speak of representable/definable sets/functions in sets of axioms other than N?

p.120, Def. 5.3.1 So, for example, $\phi :\equiv (\ \forall x)x = x$ represents $A = \mathbb{N}$ (or any other A), which means all underlying sets are representable. (right? Or does ϕ need to be a Δ-formula, specifically?)

p.121, Def. 5.3.4 Here they seem to say that a function is a subset. Do they mean to say "Notice that a total function is representable if and only if it*'s codomain*(?) is a representable subset of $\mathbb{N}^{k+1}$."

p.121 Def 5.3.5 Why do they say "(possibly)"? This is somewhat confusing.

3 5.4

I didn't mark any questions for section 5.4.

4 5.5

p.135, Table 5.1 Is there any reason for using these numbers in particular? For instance, would it matter at all if ")" had the Symbol Number 23 while "(" had the Symbol Number 21?