

Re: Turing completeness of the functional paradigm?

Source: <http://sci.tech-archive.net/Archive/sci.logic/2005-07/msg00515.html>

- *From:* "Keith Ramsay" <kramsay@xxxxxxx>
 - *Date:* 19 Jul 2005 17:07:49 -0700
-

Chris Menzel wrote:

|On Mon, 18 Jul 2005 17:42:09 +0100, Robert Low <mtx014@xxxxxxxxxxxxxxxx>
|said:

|> Babylonian wrote:

|>> PA does not define a unique notion of natural numbers. No formalism
|>> ever will.

|>

|> By 'formalism' do you mean 'first order'? Because there are
|certainly

|> sets of axioms which uniquely define the natural numbers: the second
|> order Peano axioms do this.

|

|Assuming, of course, a standard model theory for second-order
|languages.

|As I'm sure you know, though, there is also a "general" model theory
|for

|second-order languages that Henkin introduced in proving the
|completeness of simple type theory, and second-order languages
|interpreted by this model theory are no more expressive than
|first-order

|languages. Hence, so interpreted, second-order PA has nonstandard
|models. But standard, second-order *model theory* is no more forced
|upon us by the axioms of second-order PA alone than is the standard
|*model* forced upon us by the axioms of first-order PA. In this
|sense,

|anyway, it seems to me that Babs is right; the formalism alone isn't
|enough. You also need to make an assumption about the background
|model

|theory relative to which you are defining what it is for a theory to
|define a certain class.

Formalism is syntactic. The notion of "definition" is semantic. So while it's true that the syntax doesn't "force" a semantics on us, because it's true in general, I wouldn't say that it's a special problem for the natural numbers.

Re: Turing completeness of the functional paradigm?

When people refer to a formalism as defining something, they tend to mean the formalism accompanied by its usual semantics. There are plenty of formalisms that when interpreted in a standard way permit one to define the natural numbers.

Keith Ramsay

- *Follow-Ups:*

- ◆ **Re: Turing completeness of the functional paradigm?**
◇ From: Chris Menzel

- *References:*

- ◆ **Turing completeness of the functional paradigm?**
◇ From: Tom
- ◆ **Re: Turing completeness of the functional paradigm?**
◇ From: William Elliot
- ◆ **Re: Turing completeness of the functional paradigm?**
◇ From: Tom
- ◆ **Re: Turing completeness of the functional paradigm?**
◇ From: William Elliot
- ◆ **Re: Turing completeness of the functional paradigm?**
◇ From: Tom
- ◆ **Re: Turing completeness of the functional paradigm?**
◇ From: William Elliot
- ◆ **Re: Turing completeness of the functional paradigm?**
◇ From: Tom
- ◆ **Re: Turing completeness of the functional paradigm?**
◇ From: Babylonian
- ◆ **Re: Turing completeness of the functional paradigm?**
◇ From: Tom
- ◆ **Re: Turing completeness of the functional paradigm?**
◇ From: Babylonian
- ◆ **Re: Turing completeness of the functional paradigm?**
◇ From: Tom
- ◆ **Re: Turing completeness of the functional paradigm?**
◇ From: Babylonian
- ◆ **Re: Turing completeness of the functional paradigm?**
◇ From: Robert Low
- ◆ **Re: Turing completeness of the functional paradigm?**
◇ From: Chris Menzel

- Prev by Date: **Re: Prime model in DLO**
- Next by Date: **Re: Turing completeness of the functional paradigm?**
- Previous by thread: **Re: Turing completeness of the functional paradigm?**
- Next by thread: **Re: Turing completeness of the functional paradigm?**

Re: Turing completeness of the functional paradigm?

- Index(es):

- ◆ *Date*

- ◆ *Thread*