

Re: Questioning the definitions of set and element.

# Re: Questioning the definitions of set and element.

---

*Source:* <http://sci.tech-archive.net/Archive/sci.math/2008-05/msg00123.html>

---

- *From:* "Mark" <[user@xxxxxxxx](mailto:user@xxxxxxxx)>
  - *Date:* Thu, 1 May 2008 18:47:07 +0100
- 

"Arturo Magidin" <[magidin@xxxxxxxxxxxxxxxxxxxx](mailto:magidin@xxxxxxxxxxxxxxxxxxxx)> wrote in message  
[news:fvcp9o\\$27f6\\$1@xxxxxxxxxxxxxxxxxxxxxxxx](mailto:news:fvcp9o$27f6$1@xxxxxxxxxxxxxxxxxxxxxxxx)

In article <[oClSj.1209\\$7z4.15@xxxxxxxxxxxx](mailto:oClSj.1209$7z4.15@xxxxxxxxxxxx)>, Mark <[user@xxxxxxxx](mailto:user@xxxxxxxx)> wrote:

"Arturo Magidin" <[magidin@xxxxxxxxxxxxxxxxxxxx](mailto:magidin@xxxxxxxxxxxxxxxxxxxx)> wrote in message  
[news:fvck0e\\$25pn\\$1@xxxxxxxxxxxxxxxxxxxxxxxx](mailto:news:fvck0e$25pn$1@xxxxxxxxxxxxxxxxxxxxxxxx)

In article <[AijSj.861\\$NZ7.158@xxxxxxxxxxxx](mailto:AijSj.861$NZ7.158@xxxxxxxxxxxx)>, Mark  
<[user@xxxxxxxx](mailto:user@xxxxxxxx)>  
wrote:

"David C. Ullrich"  
<[dullrich@xxxxxxxx](mailto:dullrich@xxxxxxxx)> wrote in message  
[news:k0fj14lbq30cmomiaoc1f513b35bu53jr@xxxxxxxx](mailto:news:k0fj14lbq30cmomiaoc1f513b35bu53jr@xxxxxxxx)

On Thu, 1 May 2008  
12:55:46 +0100, "Mark"  
<[user@xxxxxxxx](mailto:user@xxxxxxxx)> wrote:

Hi, most  
definitions  
of element  
and set I  
have come  
across, say  
something  
like,

An element  
is any  
object of  
our  
perception  
or of our

Re: Questioning the definitions of set and element.

thought.

You found this definition  
where, exactly?

In formal set theory the  
notions of "is a set"  
and "is an element of" are  
\_undefined\_.

A set is a  
collection  
of unique  
elements.

So what's a  
collection?  
Wolfram  
says it's a  
multiset.  
Wiki says  
it's a  
multiset.

So what's a  
multiset?  
Wolfram  
says it's a  
set-like  
object.  
Wiki says  
it's a  
generalization  
of a set.

This  
basically  
gives the  
following  
definitions.

A multiset  
is a  
collection  
of elements  
A set is a  
multiset of  
unique  
elements.

Re: Questioning the definitions of set and element.

So what's a  
collection?  
Would this  
be a good  
definition of  
collection,  
A collection  
is any  
elements  
which have  
something  
in common.

Or could  
someone  
give a better  
definition?

From, "Discovering Modern Set Theory by  
Winfried Just, Martin Weese,  
American Mathematical Society"

This is not presenting a "definition" in the sense of a  
mathematical  
definition; rather, it is presenting an informal idea that is  
what  
they will be attempting to model formally.

In other words, a definition.

No; a definition, in mathematics, is a FORMAL statement. Here, you are  
presented with an informal introduction to the idea. It is not a  
definition, in the sense of a mathematical definition. You are  
committing the fallacy of equivocation by saying "In other words, a  
definition." There  $\rightarrow$ is $\leftarrow$  not definition of primitive terms in modern  
axiomatic theories. In most set theories, "set" is not defined at all;  
in a few, such as Goedel–Bernays, the definition is only one or two  
levels above the undefined terms.

[...]

As David Ulrich notes, after the advent of Hilbert and  
metamathematics, it is now understood that the basic notions  
of an

Re: Questioning the definitions of set and element.

axiomatic theory, the "primitive notions" are →undefined←.  
The  
axioms and rules describe what we can do with them, but  
those  
primitive notions do not have a definition.

He didn't note anything about Hilbert or metamathematics.

He noted that in modern theories primitive terms are undefined. This happens to be what Hilbert noted and what happened at the time.

[snip N/A stuff]

I don't see how a logical theory can be based on the undefined.

Then perhaps you should learn some basic mathematical logic.

Perhaps you should learn how not to assume things.

Are you trying to tell me that \*you\* cannot explain to someone else what  
an  
element or a set is?

No. I am INFORMING you of the verifiable fact that modern axiomatic theories are based on primitive terms, and that primitive terms are NOT defined within the theory. If you cannot handle that level of abstraction, then I suggest you take your own inadequacies and get as far away from mathematical logic as you can.

If you can, then surely you must agree that you have defined them.

No. Defining something in mathematics is NOT the same as giving an intuitive or informal explanation of something to someone. Moreover, an implicit or intuitive definition is usually based on a MODEL of an axiomatic theory, and as such do not form part of the theory but rather of a particular INTERPRETATION of the theory. Again: these are some of the basic (but subtle) notions of modern mathematics and logic. If you are unfamiliar with them, then you ought to familiarize

Re: Questioning the definitions of set and element.

Re: Questioning the defintions of set and element.

yourself with them before continuing to equivocate.

--

=====  
"It's not denial. I'm just very selective about  
what I accept as reality."

--- Calvin ("Calvin and Hobbes" by Bill Watterson)  
=====

Arturo Magidin  
magidin-at-member-ams-org

My question was about the definition for a collection, and nothing to do  
mathematic definitions, axioms, modern set theory etc.

.