Re: An uncountable countable set

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- *From*: Tony Orlow <tony@xxxxxxxxxxxxx>
- *Date*: Tue, 05 Sep 2006 15:26:46 −0400

MoeBlee wrote:

> Tony Orlow wrote:
>
>> The difference between = and <−> disappears when logical truth values are quantities from 0 through 1, so I don't see that as any better, but equivalent.
>
> You say, in the absence of having specified a syntax for a language in which this all happens.
>
>>>> 'equality' would be a better word than 'equivalence' here, I think.
>>
>> I suppose, though the same applies to "equivalence classes" doesn't it? No matter.
>
> No, that is the point. There is a difference between members of an equivalence class and the equivalence class itself.

I didn't say that all objects within a class are EQUAL, but given some criterion for distinguishing objects, one can form CLASSES where a given property is the same for all members of any given class, ignoring all other properties.

>>>> So, it's not that a−>b −> b−>a, but that a=b
>>>> <−>
>>>> b=a.
>>>
>>> That part seems messed up. a=b <−> b=a is just the
>>> symmetry of
>>> identity.

>> Yes, it's that simple. If the object IS the unique set of logical values
>> applied to all properties, then each unique set of logical values for
>> each statement about an object IS a unique object. :)

> Whatever that means, I doubt it is the principle of the symmetry of
> identity, which is that a=b <−> b=a, which makes no mentions whatsoever
> of "logical values" or "properties".

All I was saying is that if the set of property values IS the object, then the object IS the set of property values. Is that so difficult to understand?

>>>> and the
>>>> inability to discern two objects by their
>>>> properties makes them equal,
>>>> at least until some property is discovered
>>>> which can discriminate
>>>> between the two.

>>> That's going to make the theory subjective − depending on
>>> discoveries.
>>> Why don't you look at how different mathematical theories
>>> handle
>>> identity?

>> Ummm.... Isn't each isolated theory "subjective" in terms of the
>> properties that it explores?

> A theory is a set of sentences closed under entailment. Theories are
> not made subjective for our reasons for interest in them. The
> subjectivity is in our deciding to study one theory and not another,
> but as a set of sentences closed under entailment, the theory itself is
> not affected by whether we are interested in it or not or by our
> reasons for interest or disinterest in it.

You must need another cup of tea. I am not talking about psychological subjectivity, but the fact that any normal theory only addresses certain properties of the objects is discusses, and therefore may not have distinctions that are available in other theories.

>> Two objects are equal only if there exists no way to distinguish them.

See, that is what is subjective (or epistemological). We don't define equality by "way to distinguish" but rather by FORMULAS.

Formulas are a fine way to distinguish objects. For instance, I distinguish a vastly greater number of different infinities than cardinality simply by ordering formulas on a unit infinity. Good suggestion.

How do we know if this is the case? By enumerating all possible properties of each. Can we do that? No. We can only say that, given the set of properties under discussion in any given theory, the two are not distinguishable, within that theory. We cannot say that they are absolutely the same object.

No, we may do better than that in theories in which there are only finitely many primitive predicate symbols, such as set theory. I told you all about that already.

If there are only finitely many primitive predicate symbols, then there are only finitely many properties being addressed by the theory. For instance, set theory only uses 'e' and '=', and misses most properties of sets.

It depends on the specific theory. In a first order theory with infinitely many primitive predicate symbols, we have no theorem schema for doing what you suggest. But set theory has only two primitive predicates (one if you take equality as defined) so we can state such a theorem schema. However, we don't need to do that since the axiom of extensionality allows us to prove x=y merely by proving Az(zex <−> zey).

And what is z besides one of the set of properties which defines the sets x and y?

That's a confused view of the axiom of extensionality and the role of
variables.

The perception of confusion would appear to be a subjective and rather relative phenomenon.

True. You might not really be confused about the axiom of extensionality and the role of variables, but rather only pretending to be.

And you might not be confused over the nature of objects and properties, over inductive logic vs. inductive proof, between element count and value in the naturals, or any of a number of things, and maybe just want to be a devil's advocate. Hard to tell sometimes.

The distinction between elements and properties is rather
tenuous. Is it not a property of y that z e y?

For any PARTICULAR z, it's a property of y that z is or is not a member
of y. That doesn't entail that y IS the set of properties that y has.

Consider each object in the universe to be a bit. Does each unique set correspond to a unique bit string, where each object's bit posiiton is a 1 if the object is a member, and 0 if it is not?

I thought a 'bit' is a 0 or 1. In that case, in set theory, it is not the case that each object is a bit.

Sorry, a bit position. Number the objects in the universe starting from 0. Every unique set is therefore a unique bit string representing which elements are members.

The set y IS the set of
objects which are members of y, no more, and no less.

That's correct regarding set theory, and it conflicts with your notion

that a set is the set of its defining PROPERTIES. A set is the set of
its MEMBERS, and it is not the set of defining PROPERTIES.

An OBJECT is a set of its defining properties, and a set is a collection of objects which share one or more properties.

In second order, it would be a=b <-> AP(P(a) <-> P(b)),
and P=Q <->
Aa(P(a) <-> P(a)).

If you prefer, you may use <-> instead of =.

But those don't ential that, for example, b = {P | P is a
defining
property of b}.

Really, they do.

Because you say so. But you couldn't demonstrate that entailment in a
system.

I'll have to think about that. What makes you so sure?

Please just read a book on logic.

Please just think hard. :)

Yes, If I just think hard enough, in a blaze of enlightenment I'll see
that you and you alone have the answers.

There's lots of people working on answers in the face of this kind of dismissal. :)

MoeBlee

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