4 – Mathematics of the Ummites

In the Ummo letter **D45** the mathematics (Wua) of the Ummites for the number base 12 is explained.

4.1 - Numbers

D45: *Our number system is based on the number 12, while you chose a decimal system. Apart from the logical fact that the signs used by the earthly people are different, the expressions of the different complex numbers are ordered in the same way as yours.*

he first 13 numbers (with the zero) are:

The numbers 12 through 71 are written like this:

D45: *You can expect the enormous complexity of mathematical, logical, and geometric expressions (like yours) to be resolved by a large number of symbols that bear no resemblance to those used on Earth.*
We can note a curious fact: in your algebraic expressions you symbolize numbers with letters. At Ummo we use a wide range of special characters.
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4.2 - Mathematical Operators

D45: *Since you're just asking us for general ideas, here are some examples of algorithms that use real numbers (base 12).*

Addition symbol (

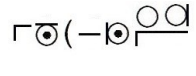
Multiplication symbol ⌠

Division symbol |

Power symbol —

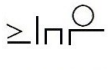
Equality symbol ⌐¯

Addition 34 + 21 = 55 ⇔



Multiplication 2 · 4 · 8 = 64 ⇔

Division 12 : 3 = 4 ⇔



Power $4^3 = 64$ ⇔

4.3 - More symbols

e 

π 

Speed of Light 

D45: *Ummo mathematicians consider of transcendental importance a simple periodic function - a sine function - which we call WoaBaeeyuee Woa (mathematical generator of the generator or God).*

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sin 

sin 2·π 

We only measure the circumference in radians (Boaalowa). Your division into sexagesimal or centesimal grades seems confusing to us.

You will notice that we use the symbol Woa (God, Source). But don't forget that we view the cosmos as a ten-dimensional system. Woa generates an infinite series of wave trains (sine functions) with different frequencies, amplitudes and phases. Space becomes so twisted, creating a series of standing waves and nodes that are reflected in the infinite universe. These standing waves are just the folds of the continuous spacetimes that we call masses (galaxies, gas, animals etc...).

4.4 - Tetravalent Logic

While our logic is two-valued, the Ummites use a four-valued logic to describe the universe, the outline of which is set out in Ummo letters **D59-2** and **NR20**.

D59-2: *First of all, we would like to point out that our idea of space, which differs significantly from the terrestrial idea, requires different mathematical foundations than yours.*

But it will not be easy for you to understand our algorithms of "Mathematics of Physical Space" (Wua Waam) without first completing a full introductory course which would require many months of study by Earth mathematics initiates.

There is a reason for this: when it comes to analysing the properties of space, the normal postulates of mathematical logic, which are known to you and to us, are not useful to you and to us. As you know, formal logic accepts what you call the "excluded middle principle" (according to which every proposition is necessarily "true" or "false"). In our Wua Waam this postulate must be rejected. We then resort to a type of multivalent logic, which our specialists call UuWuua les (tetravalent = four-valued mathematical logic), according to which each proposition takes on one of the four values:

- AiooYaa = It exists (true)
- AiooYeedoo = It doesn't exist (wrong)
- Aiooya Ammie = It exists (true) outside of our universe
- Aiooya Ou = It exists but is indefinite

Nonetheless, we still use two-valued logic (we also use it in our daily life or when studying macrophysically phenomena).

NR20: *We base our four-valued system on the formal non-acceptance of the rejection of a middle term and a third term in the dialectic. In this system, what is not is distinct from what is complementary to what is. We accept that a phenomenon can be and not be, or neither be nor not be, at the same time. Certainly, such ontological distinctions are rarely considered in everyday reality. However, they are not unknown to your thinkers, and you will find the first approaches to them in the Platonic literature and in the founding texts of Buddhist philosophy.*

So we accept, in the course of our philosophical or mathematical developments, the appearance of elements that you would consider contradictory because of the possible coexistence of BEING and NOT BEING or the refutation of both.

So the formal calculus we use is not deterministic: it can produce multiple non-incompatible conclusions. Each "point of uncertainty" (Ibozoo Iuboo) must be confronted with empirical observations to try to favour deductive branching.
Some works whose only goal is to reduce a point of uncertainty by perfecting the predictive model sometimes engaged generations of thinkers on Ummo.
We avoid any attempt at reasoning using the principle of reduction through absurdity. This principle, still widely practiced by your scientists, makes the argument fallacious.

4.4.1 - 4-valued logic

This extends binary logic to include a **macrophysical element** (exists outside of our universe) and a **microphysical element** (exists but is undetermined).
Both elements are necessary to describe the multiverse and the subatomic (quantum) level.

Since the two added states are only needed in the **cosmos-physical** framework and on the **quantum level** and they do not occur in everyday life either, one can continue to use the binary or two-valued logic as long as it concerns the "normal" material level.

In a tetravalent logic, the sentence "tertium non datur" (there is no third party) no longer applies.

The tetravalent logic is to be distinguished from the "principle of bivalence", which states that each statement is either true or false, i.e. that semantically each statement can be assigned exactly one of two truth values. So here we have a **multi-valued logic**.

In a tetravalent logic, the "law of contradiction" is also invalid, which states that a statement and its opposite cannot be valid at the same time.

Our two-valued logic is therefore to be regarded as a special case of tetravalent logic and is only relevant on a very specific level of existence (our experienced reality).

The Ummo documents can be viewed here: https://www.cosmic-library.de/ummo/index.html