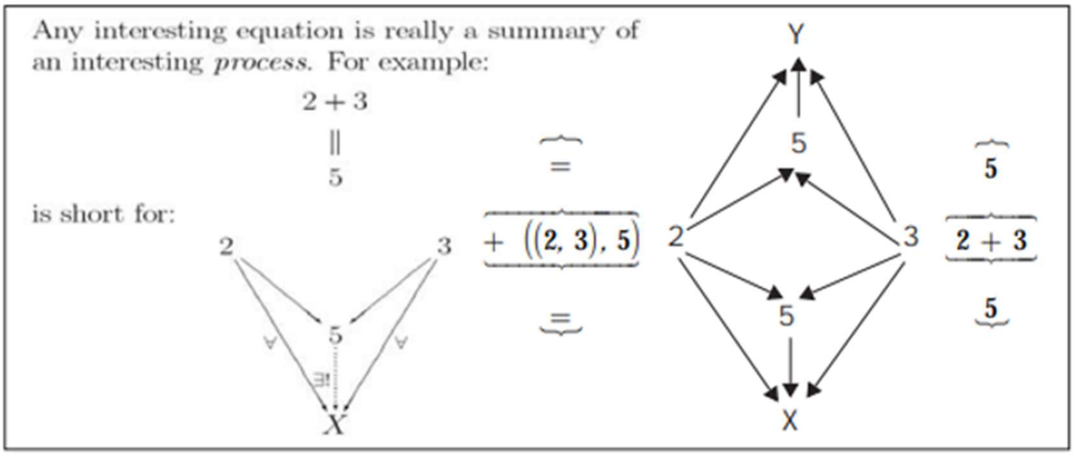
Prof. Dr. Alfred Toth

Diamondarithmetik

1. Ein Diamond ist eine polykontexturale algebraische Struktur, die Kategorien und sog. Saltatorien oder Jumpoide zu einer neuen Struktur vereinigt. Für Saltatorien gelten, ebenso wie für Kategorien, die Gesetze der Assoziativität und der Existenz der Identität für die Morphismen. Saltatorien verfügen aber zusätzlich über eine in der klassischen Mathematik unbekannte weitere Art der Abbildung, die Heteromorphismen (vgl. dazu Kaehr 2007). Den Stand der Diamondarithmetik bis 2007 sei im folgenden mit Kaehr (2007, S. 67) zusammengefaßt.

An arithmetification of diamonds is surely at once a diamondization of arithmetic.



How is the diamond operation, 2+2=5, to read? The first diagram gives an explanation of the processes involved into the addition. That is, for all numbers 2 of X and all numbers 3 of X there is exactly one number 5 of X representing the addition 2+3. This is the classic operational or categorial approach to addition (Baez).

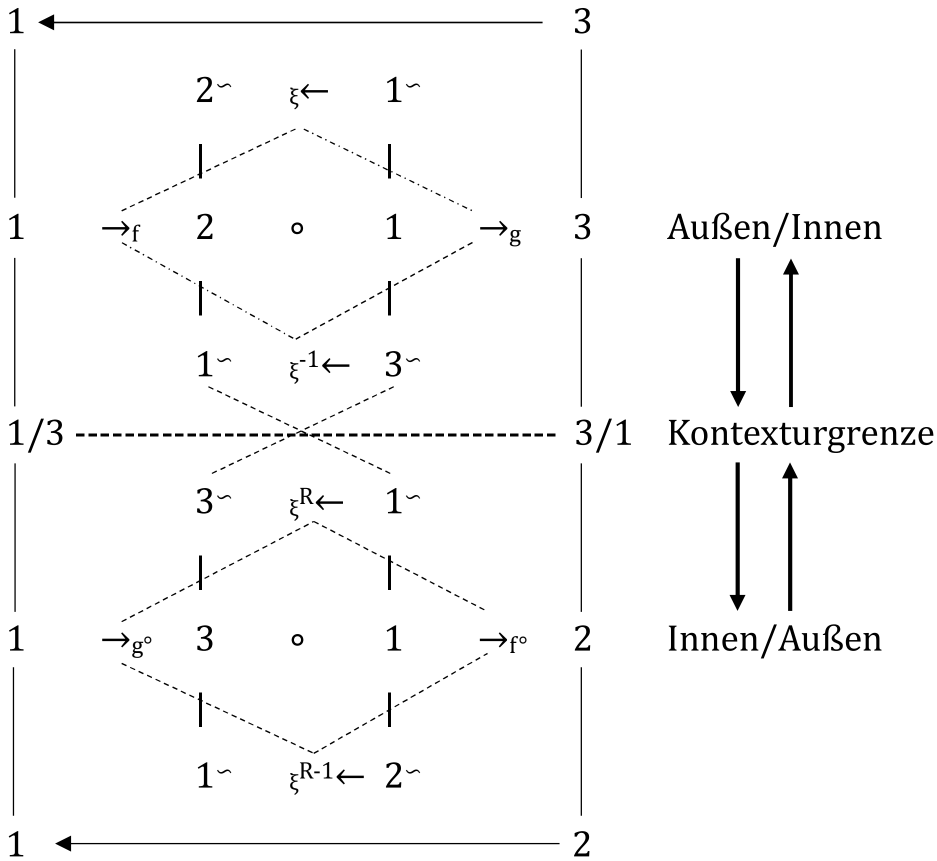
The second diagram shows the diamond representation of the addition 2+3. The wordings are the same, one for X, and one for Y. The equation is *stable* in respect of the acceptional addition and the rejectional addition iff X=Y. That is, iff the numbers and the operations belong to isomorphic arithmetical systems, then they are equivalent. If X would be a totally different arithmetical system to Y then some disturbance of the harmony between both would happen. Nevertheless, because of their rejectional direction, numbers of Y might "run" in reverse order to X and coincide at the point of X=Y.

The meaning of a sign is defined by its use. Thus, the numeral "5" belonging to the system X, has not exactly the same meaning as the numeral "5" belonging to the system Y. They may be isomorphic, hetero-morphic, equivalent, but they are not equal. Equality is given intra-contextually for terms of X only, or for terms of Y only. But not for terms between X and Y. In other words, the equation is realized as an equivalence only if it has a model in the rejectional, i.e., in the environmental or context system. Otherwise, that is, without the environmental system, the arithmetical system of the acceptance system, here X, has to be accepted as unique, fundamental and pre-given.

2. Im folgenden zeigen wir die elementare Operation

$1 + 2 = 3$

anhand der in Toth (2025a) durch Einführung des R-Diamonds erweiterten und in Toth (2009 u. 2025b) vollständig ausgebauten Diamondstruktur.



Darin sind die Abbildungen (Morphismen und Heteromorphismen):

Spagat-Funktionen (Gaps):

SP(1, 2, 3) = $(2^{\smile}\ {}_{\xi}\!\leftarrow 1^{\smile})$

×SP(1, 2, 3) = $(1^{\smile}\ {}_{\xi^{-1}}\!\leftarrow 3^{\smile})$

RSP(1, 2, 3) = $(3^{\smile}\ {}_{\xi^{R}}\!\leftarrow 1^{\smile})$

×RSP(1, 2, 3) = $({}^{\smile}1\ {}_{\xi^{R-1}}\!\leftarrow 2^{\smile})$

Risky Bridges:

RB(1, 2, 3) = $fg\xi$

×RB(1, 2, 3) = $fg\xi^{-1}$

RRB(1, 2, 3) = $g^{\circ}f^{\circ}\xi^{R}$

×RRB(1, 2, 3) = $g^{\circ}f^{\circ}\xi^{R-1}$

Literatur

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