∞ Magnifying

Hypersurreal • 4 Dec 2023

In Winning Ways Volume 2 (pg. 334) they say

> In many ways the games ∞ and $\pm\infty$ behave like enormously magnified versions of $\uparrow$ and $*$

& give us an **infinitely magnifying operation** defined by

$$\int^{\mathbb{Z}} G = \{\int^{\mathbb{Z}} G^L + n | \int^{\mathbb{Z}} G^R - n\}_{n=0,1,2,\ldots}$$

As an example they also give:

$$\int^{\mathbb{Z}} * = \{\mathbb{Z}|\mathbb{Z}\} = \pm\infty$$

Which reminds me of the function $* + n = \{n|n\}$..

After reading the affine games paper & then seeing the formula in my notes again, I got to thinking…

They essentially define $0 = \{-\infty|\infty\}$. No problems there. But they also define $☽ = \{\infty| - \infty\} = \pm\infty$. I don't have a *problem* with that. I just think $☽$ is, well.. *bigger* 🤷‍♀️

Aside interval arithmetic & fuzzy numbers

It made me wonder if something like

$$\int^{\mathbb{O}n} * = \{\mathbb{O}n|\mathbb{O}n\} = \pm\text{on}$$

would be valid.

I also wondered about this equation, because I find it rather aesthetic:

$$\int^{☽} * = \{☽|☽\} = \pm ☽ = ☽$$

I might call this a *moon magnifying* operation & speculate that

$$\int^{☽} n = ☽ : \forall n$$

I was also trying to think about game analysis for projective games. I think chess endgames could be a good fit since loopy situations are possible. Also, affine theory defines *check games*. So it seems a rather natural setting.

Was playing around with some custom cases as well just for fun (1 x n boards w/ 2 kings).