

Re: Limits

Source: <http://sci.tech-archive.net/Archive/sci.math/2007-12/msg05341.html>

- *From:* "Dave L. Renfro" <renfr1dl@xxxxxxxxxx>
 - *Date:* Sat, 29 Dec 2007 08:38:52 -0800 (PST)
-

Dave L. Renfro wrote (in part):

Less well known are the 5 logarithmic indeterminate forms: $(\log_0)(0)$, $(\log_1)(1)$, $(\log_0)(\infty)$, $(\log_\infty)(0)$, and $(\log_\infty)(\infty)$.

David W. Cantrell wrote (in part):

There are 5 because there would have been 5 indeterminate forms involving division in your first list if signs had been shown. The logarithmic forms correspond with

$-\infty/-\infty$, $0/0$, $\infty/-\infty$, $-\infty/\infty$ and ∞/∞

Thanks for your comments and, if I ever put any time into investigating this, I'll keep them in mind. A number of years ago (not really that long, but it was probably between 6 and 8 years ago) I came across a comment about these logarithmic forms. I didn't jot down the reference because I didn't expect it to be so rarely mentioned (I've never seen any mention of this idea since then, in fact), but I did write the idea down on a post-it-note that I put into a folder I have in which I toss in interesting indeterminate limit examples when I come across them (one of over a hundred such folders of topics that have relevance to things that often came up in my teaching or other things that I happen to be interested in) and I came across it yesterday when I pulled the folder out to get some examples. I'd pretty much forgotten about it (the logarithmic forms) until I saw it, but I'm still pretty sure I haven't come across the idea since I wrote the note about them.

Anyway, the main reason I'm responding is about something else that you and others (Ioannis Galikdas, Robert Israel, etc.) might be interested in. I recently came across the following

book:

Isaac Joachim Schwatt, "An Introduction to the Operations with Series", The Press of the University of Pennsylvania, 1924, x + 287 pages.

A second edition was published by Chelsea Publishing Company in 1962 (which I think was just a reprint with corrections), and reviews of it that I know of are:
Amer. Math. Monthly 32 (1925), p. 383; Mathematics of Computation 17 (1963), pp. 91–92; Amer. Math