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## Calculator: Divide by 0 gives Infinity (3/94)

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TOPIC -----

When I divide the number 1 by the number 0, using the Calculator DA, I get the answer 'infinity.' Why does the calculator give me this answer?

DISCUSSION -----

Any number divided by "nothing," or "zero" is undefined.

You can take the limit of  $1/n$  as  $n \rightarrow 0$  and you'll see that as "n" is in the whole number domain and decreases from + toward 1, and that the result approaches "1." As "n" decreases from 1 toward 0 (.9,.8,.7,....,0.0000003, ....,0.00000000002, etc.) the result gets larger (for example:  $1/.2 = 5$ ,  $1/.02 = 50$ ,  $1/.002 = 500$ , etc.). As the "n" gets smaller, the result gets larger. As "n" approaches 0, the result approaches + .

In Calculus,  $\lim (1/n)$  as  $n \rightarrow 0 \Rightarrow +$  which is undefined, so either "infinity" ( ) or "undefined" is the correct answer.

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