= 1 ? 3 using a supremum definition , but then insisted that 0 @.@ 999 ? < 1 based on her earlier understanding of long division . Others still are able to prove that 1 ? 3 =
0 @.@ 333 ? , but , upon being confronted by the fractional proof , insist that " logic " supersedes the mathematical calculations .
Joseph Mazur tells the tale of an otherwise brilliant calculus student of his who " challenged almost everything I said in class but never questioned his calculator , " and who had come to believe that nine digits are all one needs to do mathematics , including calculating the square root of 23 . The student remained uncomfortable with a limiting argument that 9 @.@ 99 ? = 10 , calling it a " wildly imagined infinite growing process . "
As part of Ed Dubinsky 's APOS theory of mathematical learning , he and his collaborators (2005) propose that students who conceive of 0 @.@ 999 ? as a finite , indeterminate string with an infinitely small distance from 1 have " not yet constructed a complete process conception of the infinite decimal " . Other students who have a complete process conception of 0 @.@ 999 ? may not yet be able to " encapsulate " that process into an " object conception " , like the object conception they have of 1 , and so they view the process 0 @.@ 999 ? and the object 1 as incompatible . Dubinsky et al. also link this mental ability of encapsulation to viewing 1 ? 3 as a number in its own right and to dealing with the set of natural numbers as a whole .

= = In popular culture = =

With the rise of the Internet , debates about 0 @.@ 999 ? have become commonplace on newsgroups and message boards , including many that nominally have little to do with mathematics . In the newsgroup sci.math , arguing over 0 @.@ 999 ? is described as a " popular sport " , and it is one of the questions answered in its FAQ . The FAQ briefly covers 1 ? 3 , multiplication by 10 , and limits , and it alludes to Cauchy sequences as well .
A 2003 edition of the general @-@ interest newspaper column The Straight Dope discusses 0 @.@ 999 ? via 1 ? 3 and limits , saying of misconceptions ,
The lower primate in us still resists , saying : .999 ~ doesn 't really represent a number , then , but a process . To find a number we have to halt the process , at which point the .999 ~ = 1 thing falls apart .
Nonsense .
A Slate article reports that the concept of 0 @.@ 999 ? is " hotly disputed on websites ranging from World of Warcraft message boards to Ayn Rand forums " . In the same vein , the question of 0 @.@ 999 ? proved such a popular topic in the first seven years of Blizzard Entertainment 's Battle.net forums that the company issued a " press release " on April Fools ' Day 2004 that it is 1 :
We are very excited to close the book on this subject once and for all . We 've witnessed the heartache and concern over whether .999 ~ does or does not equal 1 , and we 're proud that the following proof finally and conclusively addresses the issue for our customers .
Two proofs are then offered , based on limits and multiplication by 10 .
0 @.@ 999 ? features also in mathematical jokes , such as :
Q : How many mathematicians does it take to screw in a lightbulb ?
A : 0 @.@ 999999 ? .

= = In alternative number systems = =