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Division by zero and triangle functions

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In order to see simply the results of the division by zero, we will show the simple results in the typical and fundamental object triangles and triangle functions. Even the case of triangles, we will be able to derive new concepts and results from the division by zero property.

One typical result is as follows:

$$

\tan \frac{\pi}{2} = 0.

$$

The essential problems with the mysterious history of the division by zero were on the {\bf definition} of the division by zero and the strong {\bf discontinuity} of the fundamental function $y = 1/x$ at the origin. This discontinuity was not accepted for long years. One more problem for the division by zero is on the concept of the {\bf division by zero calculus}; that is, the fractions and functions cases are different, as we showed clearly. We have considered our mathematics around an isolated singular point for analytic functions; however, we did not consider mathematics {\bf at the singular point itself}. At the isolated singular point, we considered our mathematics with the limiting concept, however, the limiting values to the singular point and {\bf the values at the singular point} in the sense of division by zero calculus are different. By the division by zero calculus, we can consider the values and differential coefficients at the singular point. We therefore have a general open problem discussing our mathematics on a domain containing the singular points.

Biography

Seiichi Koshiba has graduated from the University and presently he is a retired Professor Emeritus of Gunma University. He gained a major in the theory of reproducing kernels with many applications in analysis. He has been served in many roles such as a Management position from 2003 to 2007, a High school Principal from 2007 to 2012 and the Chairman of the Mathematics Basic Academic Force Research Group from 2013. He has published over 170 original papers and his publications include Theory of Reproducing Kernels and its Applications (1988); Integral Transforms, Reproducing Kernels and their Applications (1997); Inverse Problems and Related Topics (2000); and Theory of Reproducing Kernels and Applications, Developments in Mathematics (2016).

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