Abstract for "Institute lecture" at
IIT: BHU, Varanasi, 18 Jan 2019

Indian ganita vs formal mathematics

C. K. Raju

Indian Institute of Education
G. D. Parikh Centre, J. P. Naik Bhavan
Mumbai University Kalina Campus
Vidyanagari, Santacruz (E), Mumbai 400 098

Abstract

Indians are proud of the Indian गणित tradition. But is it all past glory and no contemporary use? For, what is taught today in schools and universities is Western formal mathematics. This lecture[1] and subsequent day-long workshop[2] aims to explain the **contemporary value** of traditional Indian गणित (normal mathematics). Normal math makes math easy, especially calculus[3] and geometry,[4] hence enables students to solve harder practical problems. But to change away from Western formal math, we first need to overcome colonial indoctrination and demolish the myths and dogmas of formal math, as this lecture will do. This is not a matter of pedagogy alone. Eliminating the biased metaphysics of formal math also improves physics which is formulated using differential equations (i.e., calculus).

About the Author

C. K. Raju holds an Honours degree in physics followed by a Masters in mathematics from Mumbai and a PhD from the Indian Statistical Institute, Kolkata. He taught formal mathematics (real and complex analysis, advanced functional analysis, topological vector spaces and Schwartz distributions) for several years in Pune University, before joining C-DAC to play a key role in building the first Indian supercomputer, Param. He has long been a Professor of mathematics and computer science in various universities and institutions in India and abroad, and is the recipient of various awards. He was one of the initiators and an Editorial Fellow of the Project of History of Indian Science, Philosophy, and Culture.

He has authored numerous papers and several books, including *Time: Towards a Consistent Theory*, Kluwer Academic, Dordrecht, 1994, which explained functional differential equations as the correct basis of physics. In *Cultural Foundations of Mathematics*, Pearson Longman, 2007, he amassed evidence that the calculus originated in India and was transmitted to Europe in the 16th c. CE, where it was misunderstood. In *Euclid and Jesus: how and why the church changed mathematics and Christianity across two religious wars*, Multiversity, Penang, 2012, he explained how church indoctrination, to suit its post-Crusade theology of reason, led to a huge layer of redundant metaphysics being added to (formal) mathematics. In *The Eleven Pictures of Time* (Sage 2003) he explained how metaphysics in formal math has been politically used, for example to twist science in favour of church dogmas.

He has now abandoned formal mathematics, and, for the last decade, has advocated the use of normal mathematics as a key step to decolonise education in hard sciences. He has demonstrated the feasibility of doing so by teaching decolonised courses in math, and history and philosophy of science etc. around the world. He is currently an Honorary Professor at the Indian Institute of Education.

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1 An extended abstract is posted at http://www.ckraju.net/IIT-BHU/Extended-abstract-IIT-BHU.pdf.
2 Details of the workshop on 19th Jan are posted at http://www.ckraju.net/IIT-BHU/workshop-proposal-r.pdf.
3 Details of the undergraduate course on calculus without limits are posted at http://www.ckraju.net/IIT-BHU/Alternative-math-2-calculus-without-limits-with-references.pdf.
4 Details of the course on geometry (rajju ganit) for class IX are posted at http://www.ckraju.net/IIT-BHU/Alternative-math-1-Rajju-ganit-with-references.pdf.