IMS PUBLIC LECTURE

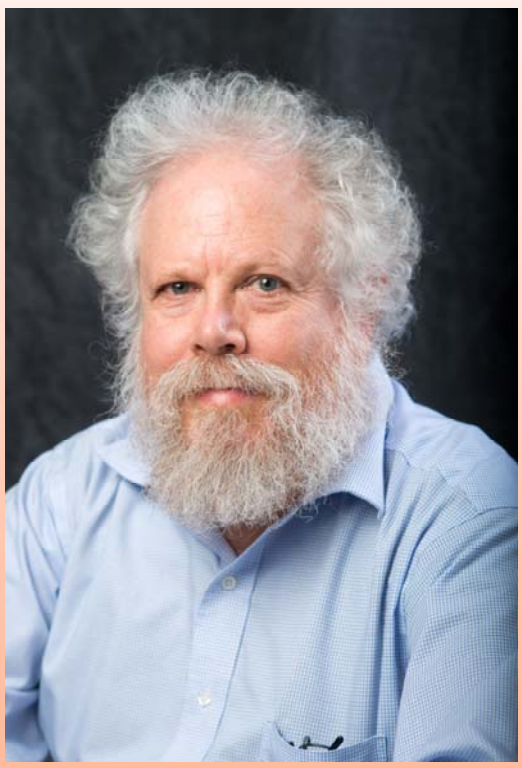
A Walk Down the Arithmetic-Geometric Mean Streets of Mathematics

Speaker: Professor Bruce Reznick
University of Illinois at Urbana-Champaign, USA

Date: Tuesday, 17 December 2013

Time: 6:30 - 7:30 pm

Venue: LT31, Block S16, Level 3
Faculty of Science
National University of Singapore
10 Lower Kent Ridge Road
Singapore 117546

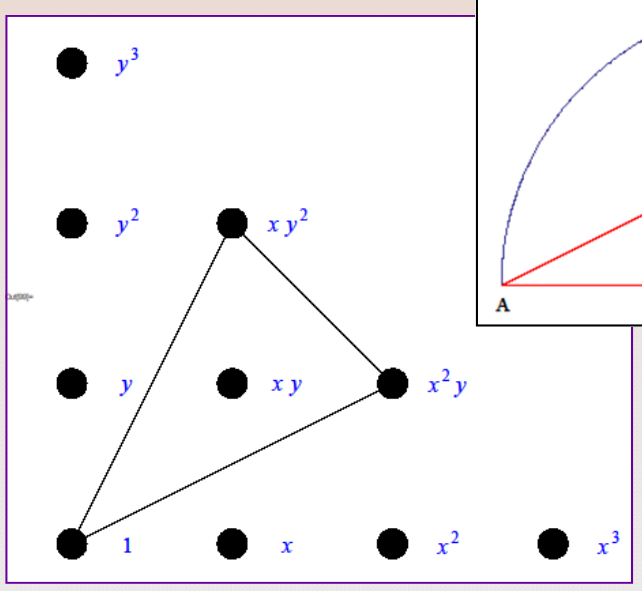


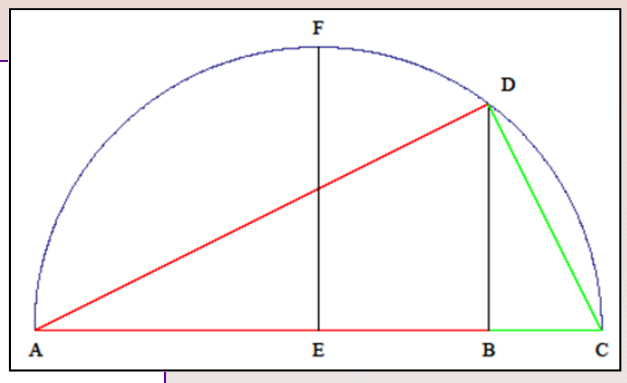
FREE ADMISSION

Abstract

How should you compute the "mean" or average of a set of *n* positive numbers? One way is to add them and divide by *n*. This gives the arithmetic mean. Another way is to multiply them and take the *n*-th root. This gives the geometric mean. Euclid knew that for two numbers, the arithmetic mean is always larger than the geometric mean unless the numbers are equal, and this is true for more than two as well.

This talk will explore many applications in optimization and finance and will let you solve some familiar calculus problems without using calculus. We will also look at a famous example of Motzkin which has had wide applications in moment problems and which, in turn, has a lot to do with the way integer points appear inside triangles and tetrahedra. You do not need to know calculus to understand most of this talk!





About the Speaker

Bruce Reznick grew up in New York City and Los Angeles. He received his BS from Caltech in 1973, where he was on the First Place Putnam teams of 1971 and 1972. His PhD in mathematics is from Stanford (1976), and after stops at Duke and Berkeley, he joined the Department of Mathematics at the University of Illinois at Urbana-Champaign in 1979, where he has been a Professor since 1989. He has been a member of the preparation committee for the 1983-1985 Putnam exams, a Sloan Foundation Fellow (1983-1986) and was in the inaugural 2012 class of Fellows of the American Mathematical Society. He has written more than sixty research publications, mainly in polynomials, combinatorial number theory and computational real algebraic geometry, with a special emphasis on Hilbert's 17th problem on sums of squares, sums of higher powers of polynomials and moments. He has supervised more than a hundred undergraduate mathematics research projects and 10 PhD dissertations. He received the UIUC Campus Award for Excellence in Undergraduate Teaching in 2009. In his spare time, he likes to work on math problems.

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