

New Trigonometric Identities

Zhi-Wei Sun

Department of Mathematics, Nanjing University

Abstract

In this talk, we introduce some new identities for trigonometric functions. For example, when n is a positive odd integer, we prove (joint with Hao Pan) the novel identity

$$\sum_{k=1}^n (-1)^k (\cot kx) \sin k(n-k)x = \frac{1-n}{2}.$$

Keywords: trigonometric functions, Chebyshev polynomials, combinatorial identities.