

# Bernoulli Numbers And Zeta Functions Springer Monographs In Mathematics

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## **Bernoulli Numbers And Zeta Functions**

Bernoulli Numbers and the Riemann Zeta Function B Sury  
Introduction B Sury is with the Indian Statistical Institute. He introduces this article by: Bernoulli troyly stunned us with his numb-er; woke us up from a deep and ignorant slumber. Its relation with Riemann zeta makes us think nothing could be heater.

## **Bernoulli numbers and the riemann zeta function**

Historically, Bernoulli numbers were introduced to give formulas for the sums of powers of consecutive integers. The real reason that they are indispensable for number theory, however, lies in the fact that special values of the Riemann zeta function can be written by using Bernoulli numbers.

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## **Bernoulli Numbers and Zeta Functions | Tsuneo Arakawa**

...

Zeta function and Bernoulli numbers. Bernoulli numbers are the coefficients of the formula of a sum of powers of natural numbers. For example, a formula of a sum of natural numbers can be expressed by two Bernoulli numbers. Zeta function can be expressed by these Bernoulli numbers.

## **Zeta function and Bernoulli numbers - Mysterious World of ...**

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## **Bernoulli Numbers and Zeta Functions (Springer Monographs ...**

The main one is the theory of Bernoulli numbers and the other is the theory of zeta functions. Historically, Bernoulli numbers were introduced to give formulas for the sums of powers of consecutive integers.

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Historically, Bernoulli numbers were introduced to give formulas for the sums of powers of consecutive integers. The real reason that they are indispensable for number theory, however, lies in the fact that special values of the Riemann zeta function can be written by using Bernoulli numbers.

## **Bernoulli Numbers and Zeta Functions | SpringerLink**

MULTIPLE ZETA VALUES, POLY-BERNOULLI NUMBERS, AND RELATED ZETA FUNCTIONS TSUNEO ARAKAWA and MASANOBU KANEKO Abstract. We study the function  $(k_1, \dots, k_n; s) = \sum_{0 < m_1 < m_2 < \dots < m_n} \frac{1}{m_1^{k_1} m_2^{k_2} \dots m_n^{k_n} s^{m_1 + m_2 + \dots + m_n}}$  and show that the poly-Bernoulli numbers introduced in our previous paper are expressed as special values at negative arguments of certain combinations of these functions.

## **MULTIPLE ZETA VALUES, POLY-BERNOULLI NUMBERS, AND RELATED ...**

The Bernoulli numbers  $B_n$  are a sequence of signed rational numbers that can be defined by the exponential generating function  $x/(e^x - 1) = \sum_{n=0}^{\infty} (B_n x^n)/(n!)$ . (1) These numbers arise in the series expansions of trigonometric functions, and are extremely important in number theory and analysis. There are actually two definitions for the Bernoulli numbers.

## **Bernoulli Number -- from Wolfram MathWorld**

That Bernoulli numbers are firmly embedded in analytic number theory is guaranteed by their relationship to reciprocal power sums, otherwise known as values of the Riemann Zeta function. Half of this relationship was already known to Euler.

## **Bernoulli numbers and the unity of mathematics**

Since this discovery, the Bernoulli numbers have appeared in many important results, including the series expansions of trigonometric and hyperbolic trigonometric functions, the Euler-Maclaurin Summation Formula, the evaluation of the Riemann zeta function, and Fermat's Last Theorem. This primer is intended to spark the reader's interest.

## **The Bernoulli Numbers: A Brief Primer**

Several properties and generalizations of Bernoulli numbers, and various relations to the Riemann zeta function and some other zeta functions are discussed. In Chapter 1, authors review the history of Bernoulli numbers and study two equivalent definitions and some basic properties of these numbers.

## **Bernoulli Numbers and Zeta Functions | Mathematical ...**

These polynomials occur in the study of many special functions and, in particular the Riemann zeta function and the Hurwitz zeta function. They are an Appell sequence (i.e. a Sheffer sequence for the ordinary derivative operator). For the Bernoulli polynomials, the number of crossings of the x-axis in the unit interval does

## **Bernoulli polynomials - Wikipedia**

The author made one such attempt with late Arakawa in the hope of finding a nice zeta function which connects poly-Bernoulli numbers with the so-called multiple zeta values, the subject of wide interest not only in number theory but also in numerous other branches such as topology, quantum groups, arithmetic geome- try, mathematical physics etc.

## **Poly-Bernoulli numbers and related zeta functions**

The Riemann zeta function or Euler-Riemann zeta function,  $\zeta(s)$ , is a function of a complex variable  $s$  that analytically continues the sum of the Dirichlet series  $= \sum = \infty$ , which converges when the real part of  $s$  is greater than 1. More general representations of  $\zeta(s)$  for all  $s$  are given below. The Riemann zeta function plays a pivotal role in analytic number theory and has applications ...

## **Riemann zeta function - Wikipedia**

Bernoulli numbers, which are ubiquitous in mathematics, typically appear either as the Taylor coefficients of  $x=\tan x$  or else, very closely related to this, as special values of the Riemann zeta function. But they also sometimes appear in other guises and in other combinations.

## **Appendix Curious and Exotic Identities for Bernoulli Numbers**

We construct and study a certain zeta function which interpolates multi-poly-Bernoulli numbers at nonpositive integers and whose values at positive integers are linear combinations of multiple zeta values. We show that both are closely related to the multiple zeta functions.

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## **MULTI-POLY-BERNOULLI NUMBERS AND RELATED ZETA FUNCTIONS ...**

The main one is the theory of Bernoulli numbers and the other is the theory of zeta functions. Historically, Bernoulli numbers were introduced to give formulas for the sums of powers of consecutive integers.