

Brownian motion and Riemann zeta function

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The theory of Brownian motion contains many remarkable identities. Some of them were considered as curiosities, though eventually they received a complete explanation inside a broader theory; for others a proper explanation remains to be found. We discuss some of such formulas related to the Jacobi theta and Riemann zeta functions, Bessel processes and Brownian excursions. Possible connections to Statistical Mechanics (ferromagnetic spin systems, Lee-Yang-Newman theorem) are sketched.