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Discrete mean values of the Riemann zeta function

I will survey the theory of the discrete moments of the Riemann zeta function and I will indicate how they differ from the ordinary continuous moments of the zeta function. In addition, I will highlight several number theoretic applications that can be derived from knowing asymptotics for the discrete moments. In particular, we will show that there exist large and small values of $\zeta'(\rho)$ where ρ denotes a non-trivial zero of the Riemann zeta function.