

Discrete moments of the Riemann zeta function

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Abstract. We discuss some discrete moments of the Riemann zeta function which have connections to arithmetic functions and to the simplicity of the zeros of the zeta function. Specifically, we consider a discrete fourth moment of the derivative of the Riemann zeta function. Random matrix theory has predicted the asymptotic size of this function. We will explain how this fourth moment differs from the ordinary fourth moment of the zeta function in two ways. In particular, we prove upper and lower bounds of the correct order for this function.

