DENSITY THEOREMS FOR THE RIEMANN ZETA-FUNCTION IN THE NEIGHBORHOOD OF THE LINE $\operatorname{Re} s = 1$

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ABSTRACT: We prove a series of density theorems for Riemannn's zeta-function near to the line $\operatorname{Re} s = 1$. In particular, we improve results of Bourgain and the constant in the exponent of the density theorem of Halász and Turán. The proof is based on exponential sum estimates of Heath-Brown, which follow from the works of Bourgain, Demeter, Guth and Wooley on the Vinogradov's mean value integral

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