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## Integral and series transformations via Ramanujan's identities and Salem's type equivalences to the Riemann hypothesis

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We consider integral and series transformations, which are associated with Ramanujan's identities, involving various arithmetic functions and a ratio of products of Riemann's zeta functions of different arguments. Reciprocal inversion formulas are proved in a Banach space of functions whose Mellin's transforms are integrable over the vertical line Re s > 1. Examples of new transformations like Widder-Lambert and Kontorovich-Lebedev type are exhibited. Particular cases include familiar Lambert and M•obius transformations. Finally a class of equivalences of the Salem type to the Riemann hypothesis is established.

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