TRANSFORMATION FORMULAE INVOLVING PARTIAL MOCK THETA FUNCTIONS

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Abstract: In this paper certain transformation formulae involving partial mock theta functions have been established.

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1. Introduction Notations and Definitions

Early in 1920, three months before his death, Ramanujan wrote his last letter to Professor G.H. Hardy. In the course of it he said: "I discovered very interesting functions recently which I call 'Mock' theta functions. Unlike the 'False' theta functions they enter into mathematics as beautifully as the ordinary theta functions. I am sending you with this letter some examples."

The first three pages in which Ramanujan explained what he meant by a "Mock-theta function" are very obscure. They will be made clearer by Hardy's comment that a Mock theta-function is a function defined by a q-series, convergent when $|q| < 1$, for which we can calculate asymptotic formula when q-tends to a rational point $e^{2\pi i r/s}$ of the unit circle, of the same degree of precision as these furnished for the ordinary theta functions by the theory of linear transformation. The last two pages of Ramanujan's notes consist of lists of definitions of four sets of Mock theta-functions with statements of relations connecting members of each of the first three sets; for fairly obvious reasons the functions in the various sets.