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On continued fraction representations of certain function of hypergeometric type

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Abstract: In the present work we have established a number of continued fraction representations for the function F(a,b,q) which is a special case of Heine function. Our results produce certain new and many known results in the literature as their special cases.

Keywords: Heine's function, continued fraction, mock theta function, Rogers-Ramanujan identity.
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(A) Introduction: Let, for $|q| < 1$

$$(a;q)_n = (1-a)(1-aq)...(1-aq^{n-1})$$

and

$$(a;q)_0 = 1$$

Then Heine series has been defined as,

$${}_2\Phi_1[\alpha,\beta;\gamma;z] = \sum_{n=0}^{\infty} \frac{(\alpha;q)_n(\beta;q)_n z^n}{(q;q)_n(\gamma;q)_n}$$

Taking $\alpha = aq,\ \beta = q$ & $\gamma = bq$,

$$F(a,b,z) = {}_2\Phi_1[aq,q;bq;z] = \sum_{n=0}^{\infty} \frac{(aq)_n}{(bq)_n} z^n$$