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On the transcendency of the solutions of a special class of functional equations: Corrigendum

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Mr V.E. Hoggatt, Jr, has pointed out an error in the examples of my paper [2]. If F_m denotes the mth Fibonacci number, these examples asserted that

$$\sum_{n=0}^{\infty} \left(F_{2^n}\right)^{-1}, = s \quad \text{say,}$$

is transcendental. This is in fact false, for by a theorem of Good [1],

$$s = (7-\sqrt{5})/2 \;;$$

for it happens that

$$\sum_{n=0}^{\infty} z^{2^n}\left(1-z^{2^{n+1}}\right)^{-1} = \frac{z}{1-z} \tag{1}$$

is a rational and not a transcendental function of z, so that Theorem 1 of my paper cannot be applied. The value of s follows from (1) on putting $z = \frac{1-\sqrt{5}}{2}$.

Hence the following changes have to be made in [2].

On p. 390, lines 7 and 10, the case $k = 1$ must each time be excluded, and in Theorem 2 the two numbers r and s may not be both be 0.

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References

[1] I.J. Good, "A reciprocal series of Fibonacci numbers", *Fibonacci Quart.* 12 (1974), 346.

[2] Kurt Mahler, "On the transcendency of a special class of functional equations", *Bull. Austral. Math. Soc.* 13 (1975), 389-410.

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