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Erratum to: On Gaussian fuzzy Fibonacci numbers

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The author would like to correct several errors in the published article. The corrected information is provided below.

1. We would like to clarify that the scalar "t" in equality (6) is defined for positive real numbers and complex numbers. It can be easily seen that this equality does not hold for negative real numbers. Since negative real numbers are not used as scalars in the proofs of the theorems in the article, there is no issue that leads to erroneous results. The above also applies to equality (14), which depends on equality (6).

2. In equation (7), intervals where mathematical contradictions arise for negative double-indexed fuzzy Fibonacci numbers are obtained. For example, in equation (7), when n=2 and α=0, an interval [2,1] is obtained, which is a contradiction. The same is true for equation (15). Therefore, the definitions in these two equations, Theorem 2 and its proof, which depend on these definitions, have been removed. Since Theorem 2 is related to generating functions, the summary part has been revised as follows:

Abstract: This paper defines Gaussian fuzzy Fibonacci numbers and derives the Binet formula for these numbers. Further, this note deals with Vajda's identity, Catalan's identity, Cassini's identity and d'Ocagne's identity in the context of these numbers.

3. In equality (10), the definition is also adjusted by taking $n \geq 1$ instead of $n \geq 0$.

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4. In the third-to-last line of the proof of Theorem 3, enclosing $(-1)^{n-2}$ in parentheses was overlooked. Consequently, this error also affected the other three results. Therefore, the correct versions of Theorem 3 and the three corollaries are given below.

Theorem 3 (Vajda Identity). For integers $n, m, r \in \mathbb{Z}$, assuming that $n+m \geq 1, n+r \geq 1$, $n \geq 1$, and $n+m+r \geq 1$, we have

$$GF_{n+m}^{\alpha}GF_{n+r}^{\alpha} - GF_{n}^{\alpha}GF_{n+m+r}^{\alpha} = (-1)^{n-2}(2-i)F_m F_r((F_1^{\alpha})^2 - F_0^{\alpha}F_2^{\alpha}).$$

Corollary 1 (Catalan Identity). For integers $n, r \in \mathbb{Z}$, assuming that $n+r \geq 1$, and $n-r \geq 1$, we have

$$GF_{n-r}^{\alpha}GF_{n+r}^{\alpha} - (GF_{n}^{\alpha})^2 = (-1)^{n-2}(-1)^{r+1}(2-i)(F_r)^2((F_1^{\alpha})^2 - F_0^{\alpha}F_2^{\alpha}).$$

Corollary 2 (Cassini Identity). For integers $n \in \mathbb{Z}$, assuming that $n \geq 2$, we have

$$GF_{n-1}^{\alpha}GF_{n+1}^{\alpha} - (GF_{n}^{\alpha})^2 = (-1)^{n-2}(2-i)((F_1^{\alpha})^2 - F_0^{\alpha}F_2^{\alpha}).$$

Corollary 3 (d'Ocagne Identity). For integers $n, k \in \mathbb{Z}$, assuming that $n, k \geq 1$, we have

$$GF_{k}^{\alpha}GF_{n+1}^{\alpha} - GF_{n}^{\alpha}GF_{k+1}^{\alpha} = (-1)^{n-2}(2-i)F_{k-n}((F_1^{\alpha})^2 - F_0^{\alpha}F_2^{\alpha}).$$