# ON HORADAM QUATERNIONS: THREE SPECIAL IDENTITIES

**Ahmet Daşdemir**

**Department of Mathematics, Faculty of Science, Kastamonu University, Kastamonu, Turkey**

**0000-0001-8352-2020**

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| **ABSTRACT**  This presentation provides three special identities of the well-known Horadam quaternions, i.e., Vajda's identity, Gelin-Cesaro identity, and Honsberger formula, by displaying their detailed proofs.  **References:**  [1] Horadam, A. F. (1963). Complex Fibonacci numbers and Fibonacci quaternions. *The American Mathematical Monthly*, 70(3), 289-291.  [2] Iyer, M. R. (1969). A note on Fibonacci quaternions. *Fibonacci Quarterly*, 7(3), 225-229.  [3] Swamy, M. N. S. (1973). On generalized Fibonacci quaternions. *Fibonacci Quarterly*, 11(5), 547-550.  [4] Horadam, A. F. (1967). Special properties of the sequence wn(a, b; p, q). *Fibonacci Quarterly*, 5(5), 424-434.  [5] Catarino, P. (2016). The modified Pell and the modified k-Pell quaternions and octonions. *Advances in Applied Clifford Algebras*, 26, 577-590.  [6] Szynal-Liana, A., & Włoch, I. (2016). A note on Jacobsthal quaternions. *Advances in Applied Clifford Algebras*, 26, 441-447.  [7] Daşdemir, A., & Bilgici, G. (2019). Gaussian Mersenne numbers and generalized Mersenne quaternions. *Notes on Number Theory and Discrete Mathematics*, 25(3), 87-96. |

# Keywords: Horadam quaternion, Gelin-Cesaro identity, Catalan's identity, Honsberger formula