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TUFTS UNIVERSITY

Department of Mathematics

February 9, 1988

Dr. Larry W. Davis, Dean
School of Graduate Studies (RS – 2047)
University of Wisconsin – Whitewater
Whitewater, WI 53190

Dear Dr. Davis,

This is a letter of recommendation in support of Dr. Malvina Baica's application for the 1988 UW-Whitewater Award for Outstanding Research.

I am presently an Assistant Professor of Mathematics at Tufts University. In response to your request for a description of my "position in the field," please find enclosed a copy of my curriculum vitae.

I will refer to Dr. Baica's publications (within the last five years) by number as listed below.

"An Algorithm in a Complex Field and its Application to the Calculation of Units," *Pacific J. Math.* **110** (1984), No. 1, 21-40.

2. "n-Dimensional Fibonacci Numbers and Their Applications," *The Fibonacci Quarterly* **21** (1983), No. 4, 285-301.

3. "Approximation of Irrationals," *Internat. J. Math. & Math. Sci.* **8** (1985), No. 2, 303-320.

4. "Diophantine Equations and Identities," *Internat. J. Math. & Math. Sci.* **8** (1985), No. 4, 755-777.

5. "Some New Combinatorial Identities Derived from Units in Algebraic Number Fields," *Discrete Math.* **54** (1985), No. 2, 133-141.

6. "Trigonometric Identities," *Internat. J. Math. & Math. Sci.* **9** (1986), No. 4, 705-714.

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Dr. Baica's research has centered on generalizing the Euclidean algorithm and applying it to natural questions in number theory. My interest in her work stems principally from its relevance to the study of certain Diophantine equations (polynomial equations with integer coefficients). The attempt to solve Diophantine equations in integers (and characterize all their solutions) has a history stretching back to ancient Greece and beyond. In every era it has fascinated many of our greatest mathematical minds.

In [1], Baica introduced a modification of the Jacobi-Perron algorithm (called **ACF**) with which she calculated new units in many algebraic number fields. The determination of the units in a given algebraic number field is central to the Diophantine question mentioned above. In addition, Baica's algorithmic approach unified many known results in the theory of units. Although her algorithm **ACF** is valid for complex numbers, in subsequent papers Baica uses the abbreviation **GEA** for **ACF** since it may be regarded as a generalization of the Euclidean algorithm for real algebraic numbers.

The fruits of **GEA** are further revealed in [2]-[5]. They include not only applications to Diophantine equations, but also good rational approximations to various algebraic irrationals and a number of interesting combinatorial identities. Baica's most recent paper [6] is independent of the other five discussed here. In it she utilizes her knowledge of units and again exhibits her facility with calculation.

Dr. Baica has been a productive scholar working in one of the most important and demanding branches of mathematics. I recommend her for the UW-Whitewater Award for Outstanding Research with pleasure.

Sincerely,

Gregory S. Call

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