A Form for Referees in Theoretical Computer Science

1 For the Editor

TITLE:	A Treatise on the Binomial Theorem		
AUTHORS:	James Moriarty		
NUMBER:	BJC449	JOURNAL:	*Bohemian Journal of Counting*
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1.1 Recommendation

1 ☐ Accept
2 ☒ Accept, advise changes
3 ☐ Accept contingent on changes
4 ☐ Revise and re-referee
5 ☐ Combine with simultaneous paper
6 ☐ Cannot be refereed properly
7 ☐ Paper not publishable in this journal
8 ☐ Paper not publishable

1.2 The Referee

1.2.1 Competence of Referee

1 ☐ Expert
2 ☐ Well-versed
3 ☒ Interested
4 ☐ Competent

1.2.2 Confidence Level

1 ☒ Very confident
2 ☐ Confident
3 ☐ Reasonably confident

1.2.3 Effort Spent

1 ☐ Great
2 ☒ Reasonable
3 ☐ Minor
4 ☐ Almost none

1.2.4 Comprehension

1 ☒ Understand perfectly
2 ☐ Understand majority
3 ☐ Understand ideas
4 ☐ Slightly confused
5 ☐ Very confused

1.2.5 Details Checked

1 ☐ All details
2 ☐ Most details
3 ☒ Enough details
4 ☐ At a high level only

This form was designed and created by Ian Parberry. It is available electronically in LaTeX format. Source code, a sample file, and full instructions are available by anonymous `ftp` from `ftp.unt.edu` (IP address 129.120.1.1) in the directory `ian/guides/form`. Please direct all feedback to `ian@ponder.csci.unt.edu`. This version was last updated on September 8, 1994.

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Date Prepared:	September 9, 1884
Notes:	

2 For the Author

2.1 The Results

2.1.1 Significance

1 ☒ Seminal
2 ☐ Interesting
3 ☐ Progress
4 ☐ Incremental progress
5 ☐ Ancient history
6 ☐ Mundane
7 ☐ Trivial
8 ☐ Cannot tell

2.1.2 Originality

1 ☒ Original
2 ☐ Simultaneous discovery
3 ☐ Small twist to known work
4 ☐ Already published by authors
5 ☐ Already published by others
6 ☐ Folk theorems

2.1.3 Proofs

1 ☒ Beautiful
2 ☐ Pretty
3 ☐ Serviceable
4 ☐ Ugly

2.1.4 Proof Techniques

1 ☒ Deep
2 ☐ Innovative
3 ☐ Clever
4 ☐ Elegant
5 ☐ Workmanlike
6 ☐ Simple
7 ☐ Trivial

2.1.5 Correctness

1 ☒ Correct
2 ☐ Correct beyond reasonable doubt
3 ☐ Probably correct
4 ☐ Probably incorrect
5 ☐ Proofs wrong
6 ☐ Results wrong
7 ☐ Cannot tell

2.2 The Paper

2.2.1 Accessibility

1 ☐ Expert
2 ☒ Specialist
3 ☐ Theoretical computer scientist
4 ☐ Computer scientist

2.2.2 Presentation

1 ☐ Almost flawless
2 ☐ Polished
3 ☒ Adequate
4 ☐ Rough
5 ☐ Incomprehensible

2.2.3 Density

1 ☐ Too long
2 ☐ Adequate
3 ☐ Terse
4 ☒ Too terse

2.2.4 Missing Details

1 ☐ Probably wrong
2 ☐ Often incomprehensible
3 ☒ Requires great effort
4 ☐ Requires effort
5 ☐ Requires small effort
6 ☐ Requires no effort
7 ☐ Too much detail

2.2.5 Technical Writing

	A	E	I	P	R	T	
1	☐	☐	☒	☒	☐	☐	Excellent
2	☐	☐	☐	☐	☐	☐	Good
3	☐	☒	☐	☐	☒	☐	Adequate
4	☐	☐	☐	☐	☐	☐	Substandard
5	☐	☐	☐	☐	☐	☐	Inadequate
6	☐	☐	☐	☐	☐	☒	Very bad
7	☒	☐	☐	☐	☐	☐	Missing

A: Abstract
E: Command of English
I: Introduction
P: Description of problem
R: References
T: Title

Referee's Report on
"A Treatise on the Binomial Theorem"
by *James Moriarty*

Prepared for Irene Adler, Associate Editor
Bohemian Journal of Counting
September 9, 1884

This paper is the journal version of a treatise written in 1861 that is universally acknowledged as a seminal work. On the strength of it Moriarty was awarded the Chair of Mathematics at one of our local universities at the age of 23. Despite the fact that the treatise was written over two decades ago, the results remain as fresh today as when they were first conceived. To mention one example, in order to discuss the computation of the binomial series he first develops an abstract system of computation based on Prof. Boole's algebra. This computing system predates the current generation of Analytical Engine and in my opinion could serve as the computing paradigm for the next century and beyond. His treatment of hypergeometric functions, expanded and updated from the original treatise, is a major achievement. His application of hypergeometric functions to proofs of his binomial identities is innovative and exciting in its own right.

Unfortunately the original treatise exists only in a few handwritten copies circulated in Europe. It is high time this material was given the widespread exposure that it deserves, and the author has done a commendable job in making the research accessible to modern audiences. The presentation does leave a little to be desired, however. The average reader will find it difficult to fill in the gaps in his proofs, and hence I would advise the author to spent a little more time in filling them in.

Moriarty begins by deriving a series of binomial formulae beginning with:

$$\sum_{s=0}^{n-p} \binom{2n+1}{2p+2s+1} \cdot \binom{p+s}{s} = \binom{2n-p}{p} \cdot 2^{2n-2p} \tag{1}$$

$$\sum_{s=0}^{n-p} \binom{2n}{2p+2s} \cdot \binom{p+s}{s} = \frac{n}{2n-p} \cdot \binom{2n-p}{p} \cdot 2^{2n-2p}. \tag{2}$$

(As a minor aside, the author has written $2p+s$ instead of the correct $2p+2s$ in Equation (2), but this is the only slip that I have detected in his formulae.) He then goes on to show links to matrix theory: in particular to computation of the nth power of a 2×2 matrix, and computation of its characteristic roots. Other applications include Fibonacci polynomials, inversion of series, and, surprisingly, the computation of orbits of asteroids.

The title of the paper is too generic and does an inadequate job of describing the contributions of this work. The author has unfortunately also neglected to provide an Abstract. His command of the English language is good except for a large number of spelling mistakes (too many to list here) which appear to have been made in haste. I recommend that the author use one of the spell-checkers that are commonly available for the current generation of Babbage's Personal Analytical Engine.