Three New Sequences for the OEIS, in Fond Memory of Jon Borwein (1951-2016)

By Shalosh B. Ekhad

[This computer-generated article is an appendix to Doron Zeilberger's talk, delivered on Sept. 15, 2016, at the Rutgers University Experimental Mathematics Seminar, and may be viewed here]

Each iteration of the The Salamin-Brent algorithm for computing Pi, starting at k=1, gives the following number of (decimal) digits

[1, 4, 9, 20, 42, 85, 173, 347, 697, 1395, 2792, 5587, 11175, 22352, 44706, 89414, 178830]

Note that the first 9 entries are listed (page 5) in the article

The quest for Pi

by David B. Bailey, Jonathan M. Borwein, Peter B. Borwein, and Simon M. Ploufe, that appeared in the print-magazine "Mathematical Intelligencer", vol. 19, no. 1 (Jan. 1997), pg. 50-57.

The analogous sequences for the Borwein brothers' cubic and quartic algorithms for 1/Pi, mentioned in the above-mentioned article seem to be new.

The Borwein brothers' amazing algorithms are described at length in their classic book, "Pi and the AGM: A study in Analytic Number Theory and the Computational Complexity" , John Wiley, 1987, where references to the original articles can be found.

Each iteration of the The Cubic Borwein-Borwein algorithm for computing 1/Pi, starting at k=1, gives the following number of (decimal) digits

[6, 22, 71, 218, 659, 1985, 5963, 17898, 53704, 161124]

Each iteration of the The Quartic Borwein-Borwein algorithm for computing 1/Pi, starting at k=1, gives the following number of (decimal) digits

[9, 41, 171, 694, 2790, 11172, 44702, 178825]

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