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McLaughlin
letters

4 pages



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Extend - easy

(5)

New sequence to add

f₉₁

McLaughlin 34617

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October 28, 1974

Refer to: 392:WIM-ef

Mr. N. J. A. Sloane
Mathematics Research Center
Bell Telephone Laboratories, Inc.
Murray Hill, New Jersey 07974

Dear Mr. Sloane:

Your recent book, A Handbook of Integer Sequences, is a fine piece of work. In addition to its obvious value for reference purposes, it is entertaining to browse through.

I would like to suggest one sequence which you might want to consider adding to future supplements. This sequence derives from Bode's Law in astronomy and consists of the ten integers

4, 7, 10, 16, 28, 52, 100, 196, 388, 772.

When these integers are divided by ten they represent the approximate distance of the planets from the Sun, in astronomical units.

<u>Planet</u>	<u>Bode Distance</u>	<u>Actual Distance</u>
Mercury	0.4	0.39
Venus	0.7	0.72
Earth	1.0	1.00
Mars	1.6	1.52
(Asteroids)	2.8	2.77
Jupiter	5.2	5.20
Saturn	10.0	9.54
Uranus	19.6	19.18
Neptune	38.8	30.06
Pluto	77.2	39.44

Clearly the "law" breaks down for Neptune and Pluto. This numerical sequence has played a surprisingly prominent role in astronomical history, but it has never received any theoretical explanation and is usually ascribed to chance.

it
Add to mailing list

Mr. N. J. A. Sloane

-2-

October 28, 1974

An interesting summary is contained in the May, 1972 issue of Sky and Telescope Magazine: "The Titius - Bode Law: A Strange Bicentenary."

In order to accord with your conventions, the results of the Bode Law easily become an infinite sequence of "Bode Numbers" using the obvious law of generation $4 + 3 \cdot 2^{n-1}$ ($n = 1, 2, 3, \dots$) which holds for all except the first term (or, adhering to your convention of using an introductory "1", for all except the first two terms).

As per your offer in the book, I would appreciate receiving any supplements which you issue.

Yours truly,

William I. McLaughlin

William I. McLaughlin, PhD.
Member Technical Staff

Bode numbers

n	0	1	2
B _n	4	7	10

$$4 + 3 \cdot 2^{n-1} \quad n = 1, 2, 3, \dots$$



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November 11, 1974

Refer to: 392-WIM:ef

Mr. N. J. A. Sloane
Mathematics Research Center
Bell Telephone Laboratories, Inc.
Murray Hill, New Jersey 07974

Dear Mr. Sloane:

Thank you for Supplement I to the Handbook of Integer Sequences. I'll look forward to future issues of this most interesting work.

Enclosed is a Xerox of the Bode law article that you requested. I have also included a draft of a paper which I recently submitted to the Fibonacci Quarterly. Its interest for you may lie in the fact that I used the Handbook to answer the question: are there any alternatives to Bode's formulation? (answer: yes, modified Tetranacci numbers).

Yours truly,

W I McLaughlin

W. I. McLaughlin
Member Technical Staff

Enclosures

USER/TEST

April 24, 1975

11:32:20

10
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28
52
100
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