ͻ following second-order multi-multi-

$2^m + 45^m + 61^m = 11^m + 27^m + 70^m$

(43 16) (16 43)

67^m (where $m = 1, 2$)

ʒ2)

that

$2^m + 45^m + 61^m + 11^m + 27^m + 70^m$

67^m

, we can write fifth-order multi-multi-
ns as we choose.

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FIND THE NEXT SEQUENCE

O. D. ANDERSON
Civil Service College
11 Belgrave Road
London SW1V 1RB

Following in the spirit of Reference 1, here is a really nasty puzzle. Four sequences are given, and the problem is "what should be the fifth one?" (The first few terms will be enough, once the way that they are generated has been established.)

This family of sequences has occurred naturally in some recent research, and it so happens that the cunning can crack the code using considerably less information than is given. But do not bank on that!

Your tormentor will be interested to see your reasoned solutions, and his will be available on request. Incidentally, only the first two of these sequences are listed in Reference 2, so you are navigating relatively unknown waters.

(1) 1, 2, 3, . . .

(2) 1, 6, 20, 50, 105, 196, . . .

(3) 1, 20, 175, 980, 4116, 14112, 41580, 108900, 259545, 572572, 1184183, . . .

(4) 1, 70, 1764, 24696, 232848, 1646568, 9343620, 44537922, 184225041, 677352676, 2254684432, 6892441920, 19571505408, 52101067968, 131018862096, 313203587004, 715536058545, 1569305708586, ...

References

1. N. J. A. Sloan, "Find the Next Term," *J. Recreational Math.*, 7(2), page 146, Spring 1974.
2. N. J. A. Sloan, *A Handbook of Integer Sequences*, Academic Press, New York, 220 pages, $10.00, December 1973, ISBN 0-12-648550-X.