

FIND THE NEXT TERM

N. J. A. SLOANE

Bell Telephone Laboratories

Murray Hill, New Jersey

Here are some interesting puzzles. Find the next two terms in the following sequences, and the rules for generating them. The first few are easy, so try them on yourself, your friends, your parents, and your children. Try the rest on your in-laws and enemies. None require specialized knowledge. Solutions are available on request. These sequences are taken from Reference 1 and were gathered from *Eureka*, the *American Mathematical Monthly*, and other sources.

- (1) 1, 4, 9, 16, 25, 36, 49, ...
- (2) 1, 3, 6, 10, 15, 21, 28, ...
- (3) 1, 1, 2, 3, 5, 8, 13, 21, 34, ...
- (4) 1, 2, 5, 12, 29, 70, 169, 408, ...
- (5) 1, 1, 3, 1, 5, 3, 7, 1, 9, 5, 11, 3, 13, 7, 15, 1, ...
- (6) 1, 21, 21000, 101, 121, 1101, 1121, 21121, ...
- (7) 1, 3, 4, 7, 11, 18, 29, 47, 76, 123, ...
- (8) 1, 2, 3, 7, 43, 1807, 3263443, ...
- (9) 1, 4, 11, 20, 31, 44, 61, 100, 121, 144, 171, ...
- (10) 1, 1, 1, 2, 1, 2, 1, 3, 2, 2, 1, 4, 1, 2, 2, 5, ...
- (11) 1, 2, 2, 1, 1, 2, 1, 2, 2, 1, 2, 2, 1, 1, 2, 1, 1, 2, 2, 1, 2, 1, 1, 2, 1, 2, 2, 1, 1, 2, 1, 1, 2, 1, 2, 2, 1, 1, 2, 1, 1, 2, 1, 2, 2, 1, 1, ...
- (12) 4, 6, 7, 9, 10, 11, 12, 14, 15, 16, 17, 18, 19, 20, 22, 23, 24, ...
(Find the next 15 terms)
- (13) 1, 2, 3, 4, 9, 27, 512, 134217728, ...
- (14) 1, 1, 2, 1, 2, 2, 3, 1, 2, 2, 3, 2, 3, 3, 4, 1, ...
- (15) 1, 2, 3, 4, 5, 6, 7, 6, 6, 10, 11, 12, 13, 14, 15, 8, 17, 12, 19, 20, 21, 22, 23, 18, 10, ...
- (16) 1, 8, 11, 69, 88, 96, 101, 111, 181, 609, 619, ...
- (17) 1, 2, 4, 10, 26, 76, 232, 764, 2620, 9496, ...
- (18) 1, 2, 4, 8, 1, 6, 3, 2, 6, 4, 1, 2, 8, 2, ...
- (19) 1, 3, 5, 8, 12, 18, 24, 30, 36, 42, 52, 60, 68, 78, ...
- (20) 0, 1, 1, 2, 4, 7, 13, 24, 44, 81, 149, 274, ...
- (21) 1, 2, 2, 3, 2, 4, 2, 4, 3, 4, 2, 6, 2, 4, 4, 5, ...
- (22) 4, 6, 9, 10, 14, 15, 21, 22, 25, 26, ...
- (23) 1, 5, 19, 65, 211, 665, 2059, 6305, 19171, 58025, 175099, ...
- (24) $M \heartsuit 8 \spadesuit 5$.

Reference

1. N. J. A. Sloane, *A Handbook of Integer Sequences*, Academic Press, New York, December 1973, 220 pages, \$10.00, ISBN 0-12-648550-X.