Gopal Krishna Panda and Sushree Sangeeta Pradhan
Triangular-Like Numbers That Are Triangular,
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Abstract

A balancing-like sequence is a recurrence sequence satisfying the recurrence relation $x_{n+1} = Ax_n - x_{n-1}$ with initial terms $x_0 = 0$ and $x_1 = 1$ and $A > 2$ is a positive integer. For any given A, the nth triangular-like number is defined as $\tau_n(A) = \frac{x_n \cdot x_{n+1}}{A}$. All the triangular-like numbers corresponding to the balancing-like sequence with $A = 4$ are triangular numbers. However, no other balancing-like sequence enjoys this property.