

University of Colorado
Department of Mathematics
Problem of the Month
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Let a_n be a sequence of numbers defined by

$$a_{n+3} = \frac{(n^2 + n + 1)(n + 1)}{n}a_{n+2} + (n^2 + n + 1)a_{n+1} - \frac{n + 1}{n}a_n,$$

$a_1 = 1, a_2 = 0, a_3 = 1$. Show that for every $n \geq 1$ a_n is an integer and, moreover, a complete square.