

Peer Review

Review of: "Patterns of Squares Around an Arbitrary Triangle"

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In this paper, an interesting and seemingly new generalization of the Pythagorean theorem is presented. A generalized pattern of four (hinged) squares around an arbitrary triangle is constructed. The sums of areas of opposite squares in the pattern are proved to satisfy certain recurrences. The method of proof is nicely geometric, using vectors and their scalar products instead of trigonometry, and I think it is all correct.

Corresponding coefficients occur as sequences A001353 and A001835 of the OEIS, giving them a new geometric meaning and application.

The last two sequences considered in the paper are $s_i = s(i) : 0, 2, 30, 420, 5852, 81510, \dots$, which is A217855 of the OEIS, and this is again, as it seems, a new geometric application.

But the sequence $r_i = r(i)$ satisfies $r(i) = 2s(i) + 1$, with $r(1) = 1, r(2) = 5$. From the recurrence for A217855, we easily get the recurrence $r(i) = 14r(i-1) - r(i-2) - 8$, and $r(1) = 1, r(2) = 5$. So, the (correct) sequence $r(i)$ is : 1, 5, 61, 841, 11705, 163021, ... The sequence obtained from $r(i)$, namely $r(i) - 1$ (by dropping 0 and 1), is A123480 in the OEIS. And once again, this is a new geometric interpretation of this sequence.

Declarations

Potential competing interests: No potential competing interests to declare.