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Duane DeTemple* (detemple@wsu.edu), Mathematics Department, Pullman, WA 99164-3113, and **Matthew Hudelson** (hudelson@math.wsu.edu), Mathematics Department, Pullman, WA 99164-3113. *Square-Banded Polygons and Affine Regularity.*

Given a plane polygon P of m sides, erect squares on the sides of P that all face inward or all face outward. These squares, together with the triangles interspersed between successive pairs of squares, form the *first band*. The *second band* consists of the squares erected on the remaining side of each triangle in band one, together with the quadrilaterals interspersed between these squares. Subsequent bands of m squares and interspersed quadrilaterals are constructed in the same manner. Square banded m-gons have a number of surprising properties. For example, if S_1 and S_2 denote the sum of the areas of the squares in bands one and two, then $S_2 \geq 4\sin^2(\pi/m)S_1$. Equality holds if and only if P is affinely regular. Moreover, the non-negative value of $S_2 - 4\sin^2(\pi/m)S_1$ can be identified geometrically, thereby extending a result of Euler from quadrilaterals to general m-gons. Other properties of square-banded polygons involve linear relations between the sums of areas of the squares in successive bands, the Fibonacci numbers, and some striking tiling patterns. (Received September 05, 2000)