Let $F = A_0A_1 \dots A_n$ be a convex polygon in the plane. Define for all $1 \leq k \leq n-1$ the operation f_k which replaces F with the new polygon

$$f_k(F) = A_0 \dots A_{k-1}A'_kA_{k+1} \dots A_n,$$

where A'_k is the point symmetric to A_k with respect to the perpendicular bisector of $A_{k-1}A_{k+1}$. Prove that $(f_1 \circ f_2 \circ \dots \circ f_{n-1})^n(F) = F$. We suppose that all operations are well-defined on the polygons, to which they are applied, i.e. results are convex polygons again. ($A_0, A_1, \dots, A_n$ are the vertices of F in consecutive order.)