Persistent homology has emerged as a novel tool for data analysis in the past two decades. However, there are still very few non-convex shapes or manifolds whose persistent homology barcodes (say of the Vietoris–Rips complex) are fully known. Towards this direction, we provide a near-complete characterization of the homotopy types of Vietoris–Rips complexes of the boundary of any regular polygon in the plane. Indeed, for $P_n$ the boundary of a regular polygon with $n$ sides, we describe the homotopy types and persistent homology of the Vietoris–Rips complexes of $P_n$ up to scale $r_n$, where $r_n$ approaches the diameter of $P_n$ as $n \to \infty$. Surprisingly, these homotopy types include spheres of all dimensions (as $n \to \infty$) and wedge-sums thereof. Roughly speaking, the number of $2\ell$-dimensional spheres in such a wedge sum is linked to the number of equilateral (but not necessarily equiangular) stars with $2\ell + 1$ vertices that can be inscribed in $P_n$. We furthermore show that the Vietoris–Rips complex of an arbitrarily dense subset of $P_n$ need not be homotopy equivalent to the Vietoris–Rips complex of $P_n$ itself. As our main tool, we employ the recently-developed theory of cyclic graphs and winding fractions. (Received September 24, 2017)