Starting with a simplicial complex $T$ that is homeomorphic to a 2-dimensional disk with four boundary points, we consider all ways to realize the complex in the plane such that the edges are straight line segments and the boundary is a square. We show that there is an irreducible polynomial, which depends on the combinatorics of $T$, that must be satisfied by the areas of the triangles. We present various results about the degree and the coefficients of this polynomial. (Received August 05, 2010)