Computation and Analysis on Reinhardt Polygons with Multiple Prime Divisors
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A Reinhardt polygon is a convex polygon which is the optimal solution to three unique problems: fixing diameter and maximizing perimeter, fixing diameter and maximizing width, and fixing perimeter and maximizing width. There has been previous work to enumerate and categorize these polygons whose sides have two prime divisors. In this talk, we will discuss extensions of previous techniques to polygons with three or more prime divisors. We will first discuss the extensions of a previous construction to find all polygons of the form $n = pqr$ to polygons of the form $n = pqlr$, where p, q, and l are primes and r is an integer greater than or equal to 2. We will also discuss relevant theoretical bounds on the number of polygons of the form $n = pqlr$ for a given n. In addition, we will introduce a new method that can be used to produce all Reinhardt 105-gons.