1117-52-259   **Michael J. Mossinghoff*** (`mimossinghoff@davidson.edu`), Davidson College, Box 6996, Davidson, NC 28035-6996. *Constructing Reinhardt polygons.* Preliminary report.

A *Reinhardt polygon* is a convex n-gon that is optimal in a number of geometric extremal problems in the plane, for example, they have maximal perimeter relative to their diameter. It is known that many distinct Reinhardt polygons exist with a fixed number of sides n, for almost every positive integer n. Some of these polygons exhibit a particular periodic structure and are relatively straightforward to generate; others are known as sporadic and are more challenging to construct. We describe a number of algorithms for constructing sporadic Reinhardt polygons with n sides, which employ some properties of the principal ideal generated by the $2n$th cyclotomic polynomial. Some of the methods we describe were investigated by students at a summer REU program at the Institute for Computational and Experimental Research in Mathematics. (Received January 15, 2016)