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**Jim Foster** and **Tamas Szabo\*** ([szabot@uww.edu](mailto:szabot@uww.edu)), 800 Main St, Dept. of Math. and Comp. Sci., UW Whitewater, Whitewater, WI 53190. *Diameter graphs of polygons and the proof of a conjecture of Graham.*

We show that for an  $n$ -gon with unit diameter to have maximum area, its diameter graph must contain a cycle, and we derive an isodiametric theorem for such  $n$ -gons in terms of the length of the cycle. We then apply this theorem to prove Graham's 1975 conjecture that the diameter graph of a maximal  $2m$ -gon ( $m \geq 3$ ) must be a cycle of length  $2m - 1$  with one additional edge attached to it. (Received September 13, 2007)