Jim Foster and Tamas Szabo* (szabot@uw.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)