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B Lynn Bodner* (bodner@monmouth.edu), Mathematics Department, Monmouth University, Cedar Avenue, West Long Branch, NJ 07764. *Recreating a 14th Century 14-Pointed Star Polygon Design Found on the Mimbar of the Mausoleum of Barquq in Egypt.*

The most ubiquitous star polygons found in geometric Islamic art are those that may be created within regular n -gons that are constructible in the Euclidean sense, where $n = 4, 5, 6, 8, 10, 12,$ or 16 . That is, these polygons may be constructed using only a compass and straightedge. For $n = 7, 9, 11, 13, 14, 18,$ the regular n -gons may only be constructed approximately using these tools. Of these, we will explore the conceptualization and creation of a 14-pointed star polygon design found on panel of the mimbar of the Mausoleum of Barquq in Cairo, Egypt, dating from 1386. It appears as EGY 1318 of the Pattern in Islamic Art: The Wade Photo Archive and as Plate 168 of Bourgoin's Arabic Geometrical Pattern and Design, a rich source of 190 Islamic patterns, first published in 1879 and based upon drawings of Islamic monuments in Cairo and Damascus. More specifically, our exploration seeks to answer the question, "How did the original designer of this pattern determine, without mensuration, the proportion and placement of the star polygons comprising the design?" We also propose a plausible Euclidean "point-joining" compass-and-straightedge reconstruction, using the Geometer's Sketchpad software program, the electronic equivalent of the compass and straightedge. (Received August 31, 2011)