

1065-51-34

Reza Sarhangi* (rsarhangi@towson.edu), Reza Sarhangi, PhD, Department of Mathematics, Towson University, 8000 York Road, Towson, MD 21252. *Compass and Straightedge Constructions and Modularity*.

The first part of this presentation is about geometric constructions using different types of compasses. The paper addresses the mathematics and history behind the three artwork plates, which will be shown during this talk.

After introducing the Collapsing Compass, the construction of the regular pentagon using a Rusty Compass will be presented along with artwork inspired by this construction. The next is the regular 17-gon construction. The historical significance of this construction, which led Johann Carl Friedrich Gauss (1777-1855) to prove the impossibility of 7-gon construction, will be discussed. The last section of the first part is about introducing an approximation of the regular heptagon based on a construction presented by Abûl-Wefâ Buzjani (940-998).

The second part of the talk is based on a different approach than using a compass in making designs. The creation of geometric mosaic designs has long relied on compass-straightedge constructions. Nevertheless, artisans have used other methods, such as modules formed from “cutting and pasting” of single-color tiles. During this talk it will be demonstrated how modules created from simple tiles may be used as a medium for designing more complex mosaic patterns. (Received September 09, 2010)