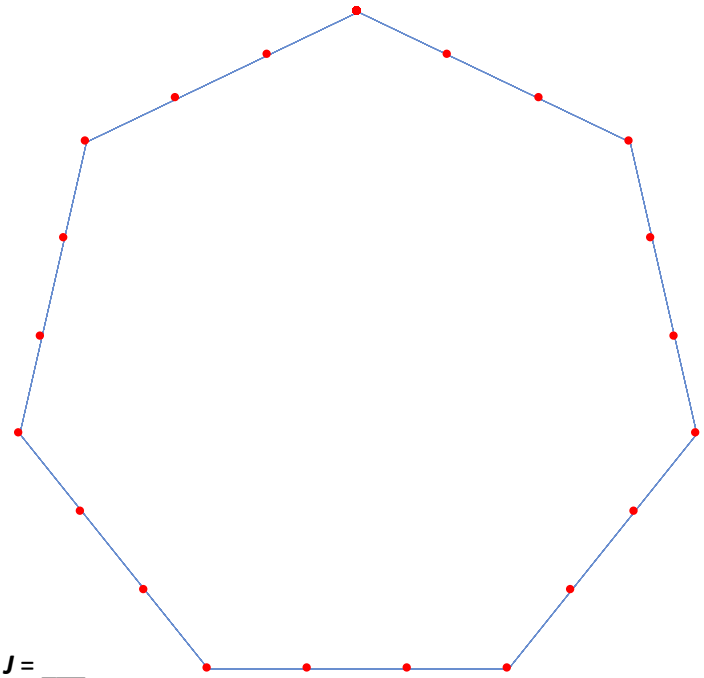
Pencil and Ruler Exercise: **Varying *J* (polygonal vertex jumps)**

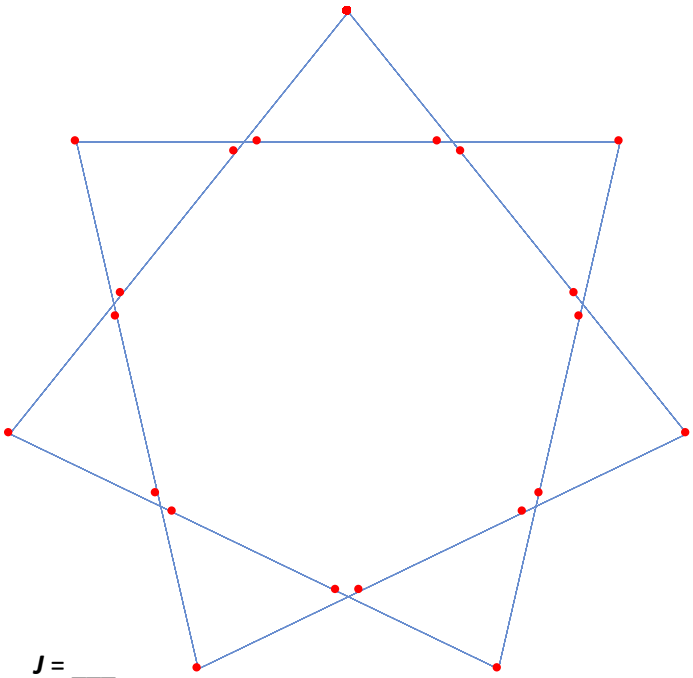
for fixed ***n*** (vertices in polygon), ***S*** (subdivisions between vertices) and ***P*** (subdivisions between points)

FACT: All four subdivision dot-plots have the same number of ***n***, ***n*** =____ , and the same number for ***S***, ***S*** =____.

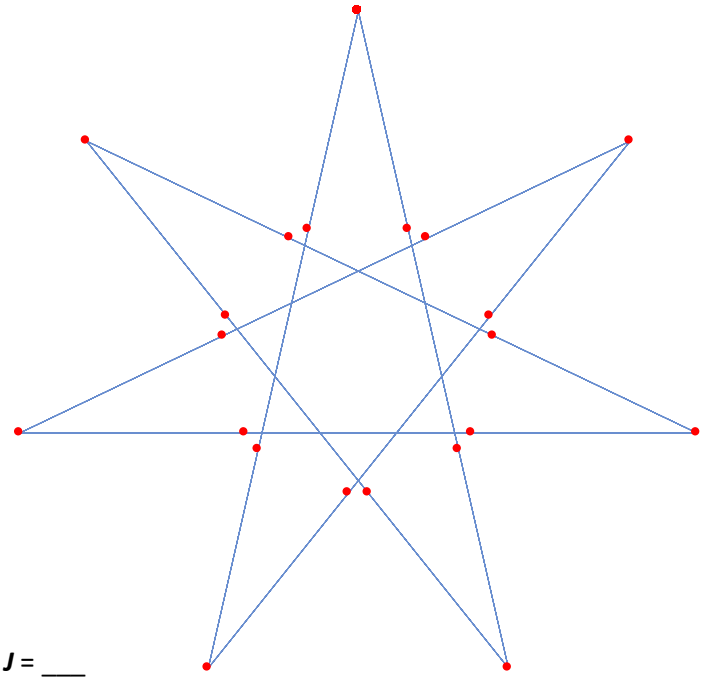
Drawing Instructions: Start at the top of each circle and *draw each image from point to point* with pencil and ruler assuming **two** subdivisions between points, ***P*** = **2**.



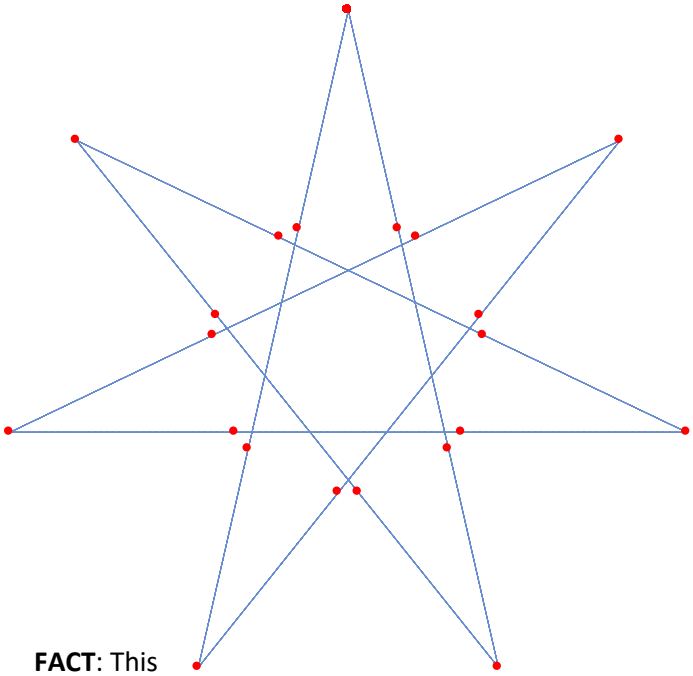
J = ___



J = ___



J = ___



FACT: This ***J*** is 1 larger than the lower left ***J***. Therefore, this ***J*** = ___

Briefly explain how the two lower images differ from one another. _____

Does this help you see why you only need to think about jumps where ***J*** < ***n***/2 if all you care about is finding distinct images? The only difference in this instance is the way that the image *appears* to be created in moving around the vertex frame. One version appears to be drawn in a clockwise fashion the other appears to be drawn counterclockwise.