TILE COUNT IN THE INTERIOR OF REGULAR n-GONS DISSECTED BY MEDIANS

RICHARD J. MATHAR

Abstract. The regular N-gon is subdivided into smaller polygons (tiles) by the subset of diagonals which connect the N vertices with the midpoints of their $N-2$ opposite edges.

1. Summary

Given the N sided regular polygon, its interior is dissected into non-overlapping regions (polygons, tiles) by $N(N-2)$ diagonals. Each diagonal starts at one of the N vertices and ends at the center of one of the $N-2$ opposite edges [1, A320422]. (Opposite edges of a vertex are all those that do not contain the vertex.)

References

1. O. E. I. S. Foundation Inc., *The On-Line Encyclopedia Of Integer Sequences*, (2018), http://oeis.org/. MR 3822822

URL: `http://www.mpia-hd.mpg.de/~mathar`
Email address: `mathar@mpia-hd.mpg.de`

Max-Planck Inst. Astronomy, Königstuhl 17, 69117 Heidelberg, Germany

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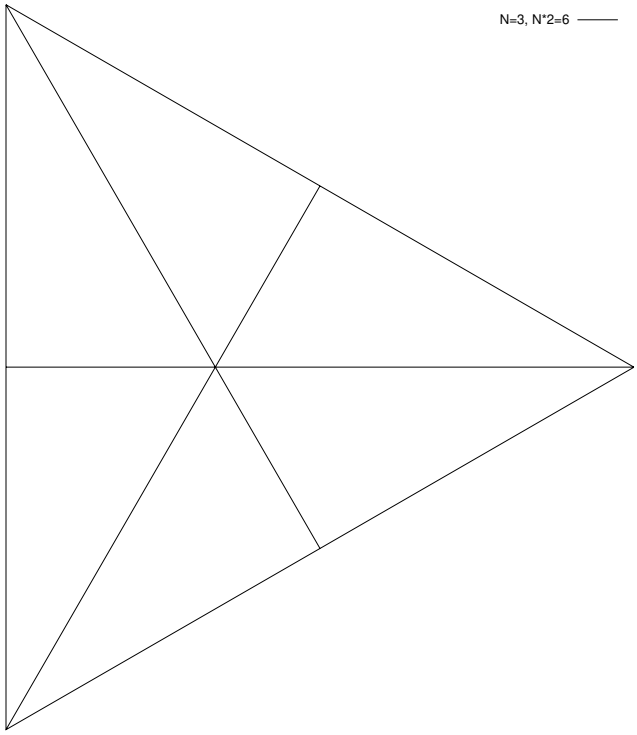

FIGURE 1. $N = 3$ sides: 6 tiles, 2 triangular tiles replicated 3 times.

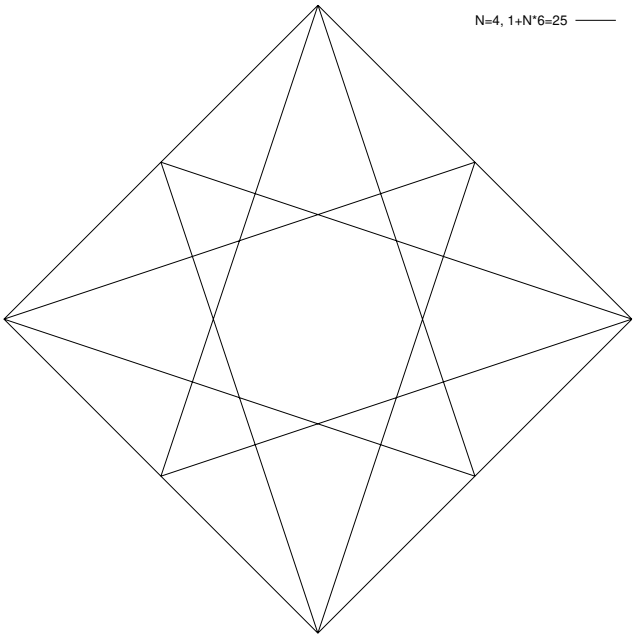

FIGURE 2. $N = 4$ sides: 25 tiles.

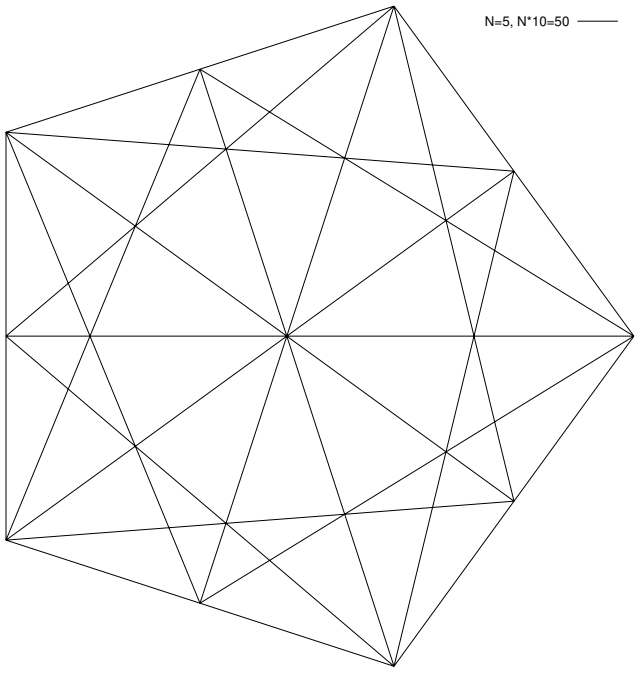

FIGURE 3. $N = 5$ sides: 50 tiles.

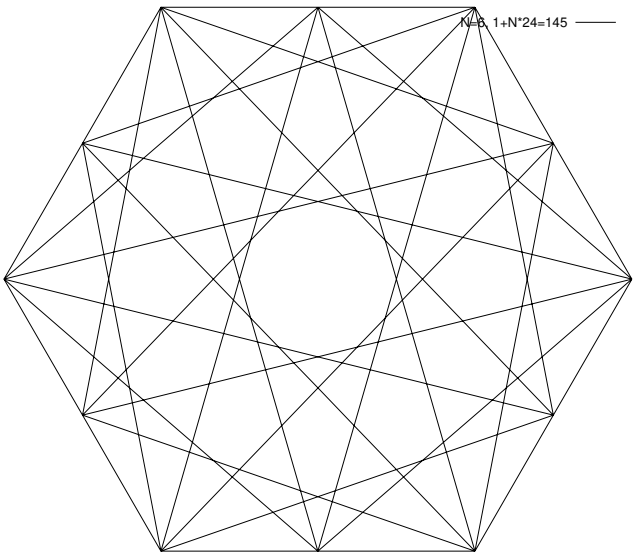

FIGURE 4. $N = 6$ sides: 145 tiles.

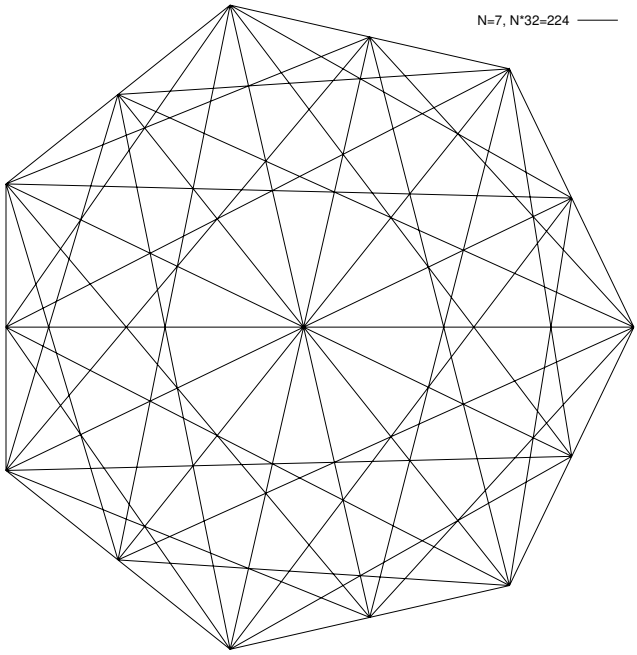

FIGURE 5. $N = 7$ sides: 224 tiles.

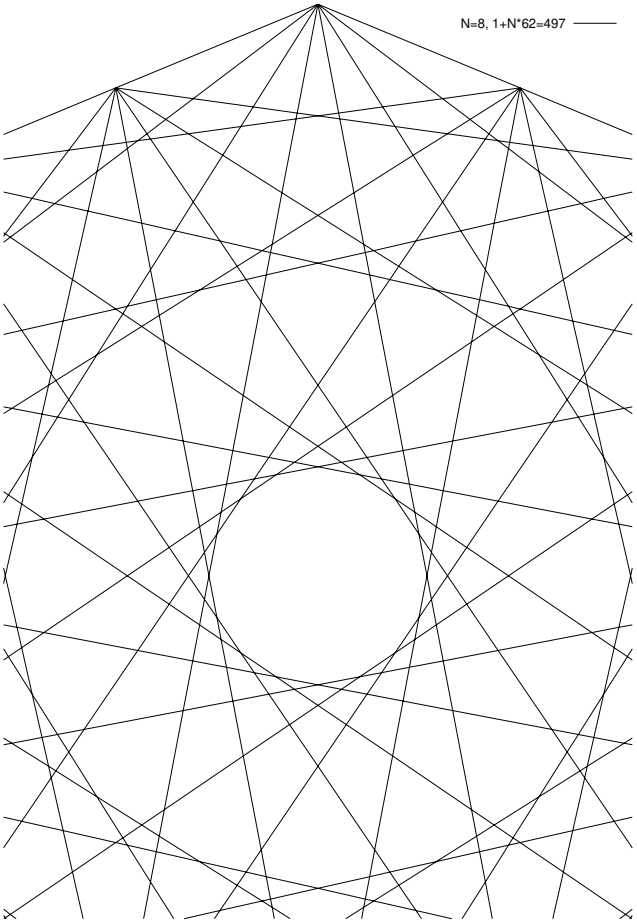

FIGURE 6. $N = 8$ sides: 497 tiles.

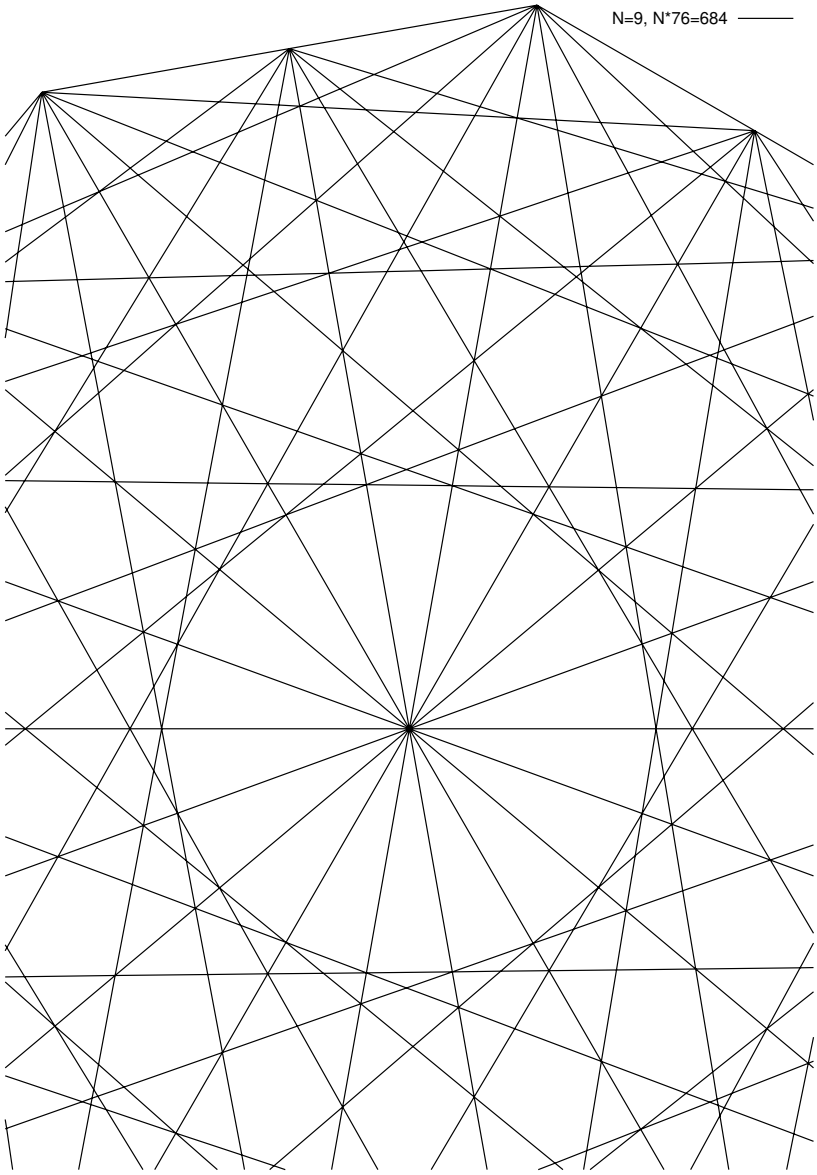

FIGURE 7. $N = 9$ sides: 684 tiles.

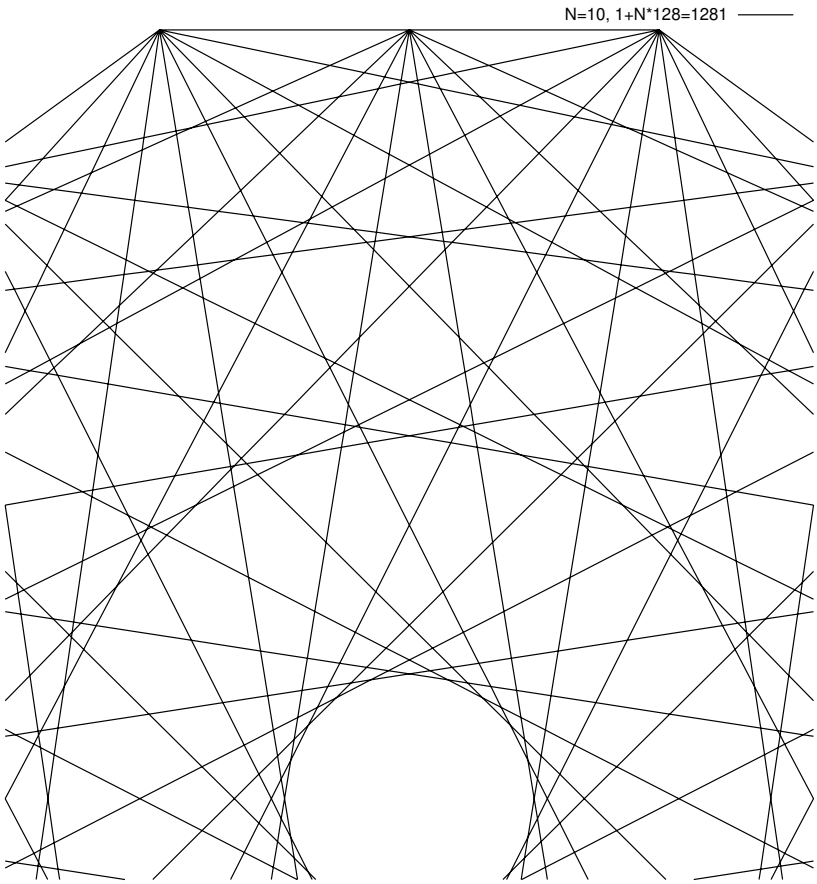

FIGURE 8. $N = 10$ sides: 1281 tiles.

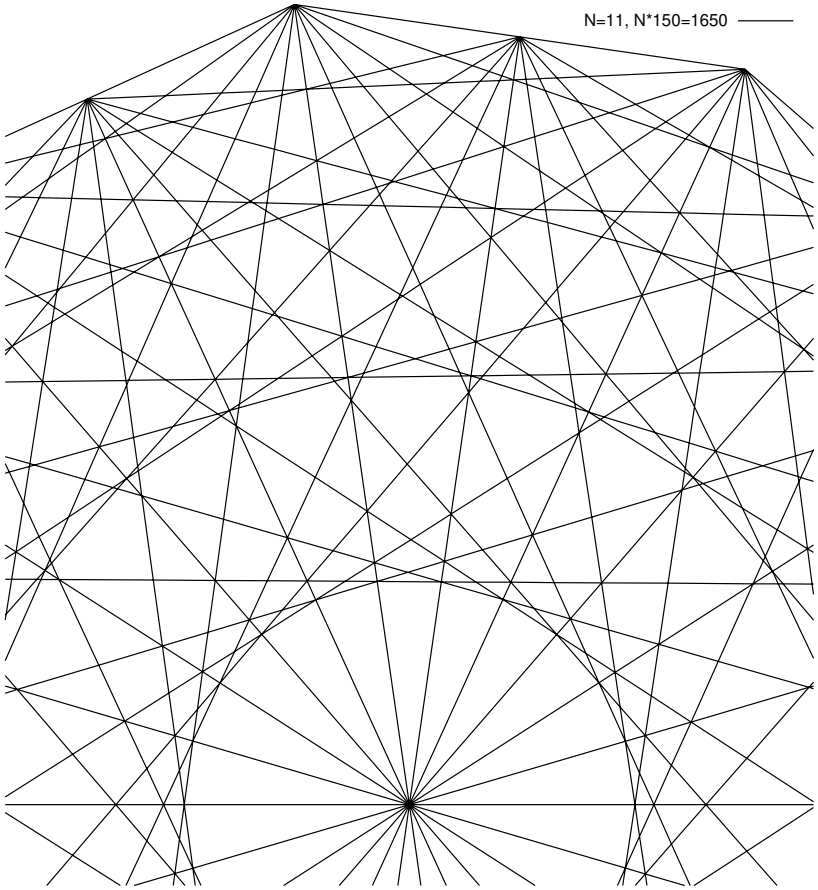

FIGURE 9. $N = 11$ sides: 1650 tiles.

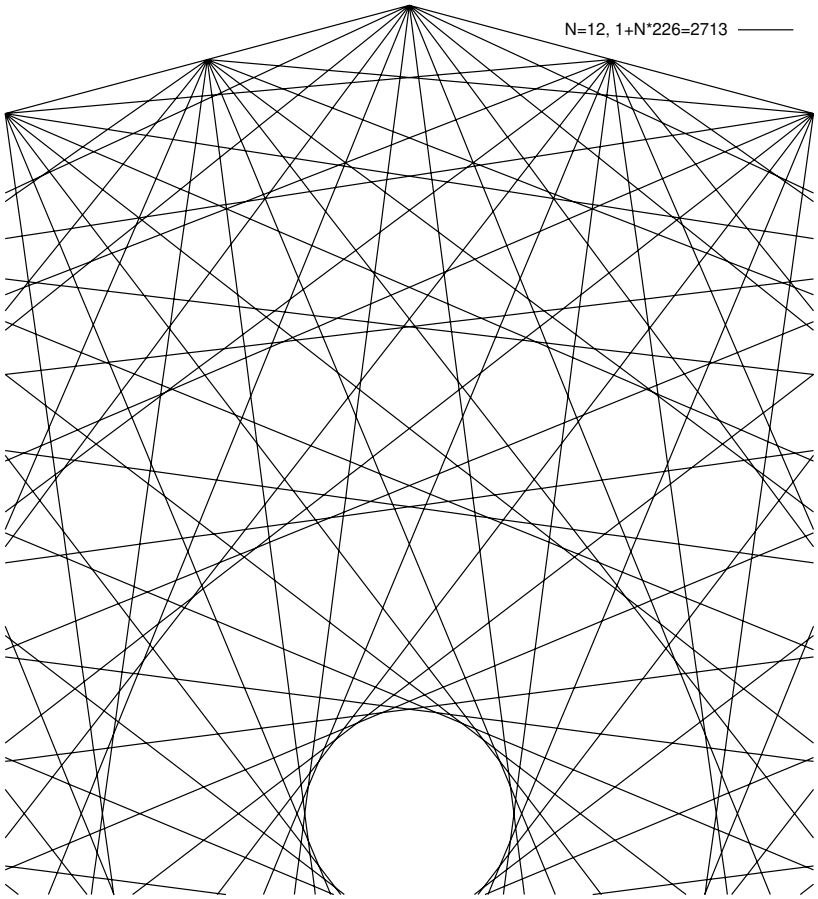

FIGURE 10. $N = 12$ sides: 2713 tiles.