

180° Rotational Symmetry

The three images at right exhibit 180° rotational symmetry. The image is the same if you turn it upside down, see [E6.4.1](#).

These three examples all have $n = 6$ with toggle mirror turned on, but the images vary by the number of jumps in the jump set and by r .

The top image has 3 jumps in the jump set: [\(6,6,J\(1,3,5\)\)](#).

The middle image has 4 jumps in the jump set: [\(6,14,J\(1,2,4,5\)\)](#).

The bottom image has 5 jumps in the jump set: [\(6,10,J\(1,2,3,4,5\)\)](#).

To create your own image, follow these n , Jump set and r rules.

n . The n -gon must be even.

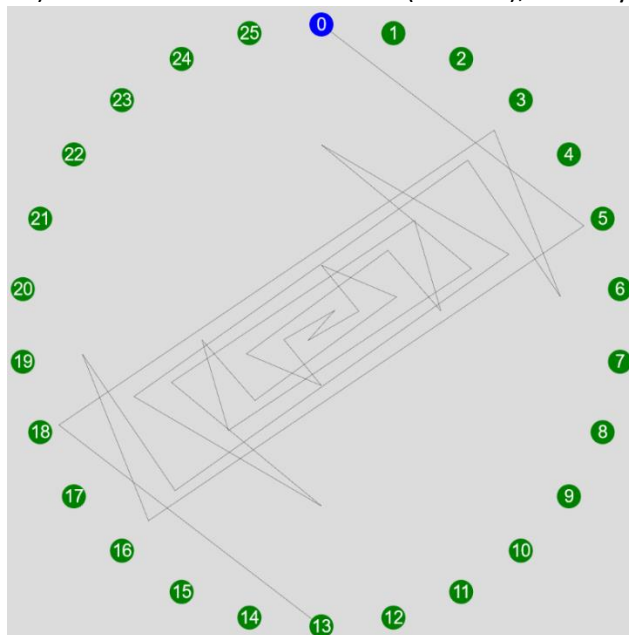
Jump Set. The number of jumps in the jump set, k , can either be even or odd. If k is even, each first half jump is matched with a second half jump with no middle jump. If k is odd, then there is a single non-matched middle jump separating the halves of the jump set. Both have the same rule about first and second half of jumps in the set.

First/Second Half. Jumps prior to the middle jump can be any value but jumps past the middle are mirrored reflections of the initial jump. For example, J_1 and $J_k = n - J_1$ and J_2 and $J_{k-1} = n - J_2$, and so on.

If k is odd, the middle jump must equal $n/2$, like the 3 in top and bottom images to the right. This creates the partial diameter lines from 1-4 at top and 0-3 at bottom.

r . Twice the reduction factor must be a multiple of k .

Another example. The bottom left [\(26,15,J\(5,11,3,23,15,21\)\)](#) 30-line image follows these rules. It is worthwhile to follow the first jump set worth of lines in this instance. The endpoints are on the following vertex radius vertices: 5, 16, 19, 16, 5, 0. These four vertex radii (0, 5, 16, and 19) are used in each of the 5 sets ($30 = 5 \cdot 6$); the only difference is that



each subsequent set is $k/r = 2/5$ in on the vertex radius according to the radius reduction rule. Consider the sharp points on the vertical diameter created by J_6 and J_1 . They are separated from each other by $2/5$ of a radius along the line from 0 to 13.

