



10. Clockwise and Counterclockwise Spirals

All images in **PwP** are counted clockwise starting at the top but that does not mean that they necessarily look that way. The small images are $n = 7$, $r = 10$ with $J = 3$ and 4 . The large images are $n = 50$, $r = 200$ with $J = 1$ and 49 . Both are mirrors of one another since $J_1 + J_2 = n$.

 The left images are clockwise spirals because each starts off moving to the right. The first endpoint on top is $1/10^{\text{th}}$ inside the 3^{rd} vertex and on bottom is $1/200^{\text{th}}$ inside the 1^{st} vertex.

 The right images start off going to the left and appears drawn in a counterclockwise direction. Both appear to be created by moving counterclockwise by these same quantities but in actuality, were created by jumping $n - J_1$ (4 , top and 49 , bottom) vertices clockwise.

In general, if $J < n$: images will appear clockwise if $J < n/2$ and counterclockwise if $J > n/2$. If $J = n/2$ the image is a vertical line.

