paths can be used as actual strokes, guides for animations, or values for other attributes (e.g. color)

ovals

\[ N = \text{number of points} \]
\[ \text{angle} = 2\pi \frac{n}{N} \]
\[ x_n = r_a \cos(\text{angle}) \]
\[ y_n = r_b \sin(\text{angle}) \]

*can be used for all regular polygons (triangles, diamongs, pentagons, etc.)

periodic

\[ y = \sum \alpha \sin(\beta x + \gamma) \]

linear parameterized

\[ a_x = x_1 - x_0 \quad a_y = y_1 - y_0 \]
\[ b_x = x_0 \quad b_y = y_0 \]
\[ x_t = a_x t + b_x \quad y_t = a_y t + b_y \quad (t=0\ldots1) \]

quadratic parameterized

\[ a_x = x_1 - x_0 - dx_0 \quad a_y = y_1 - y_0 - dy_0 \]
\[ b_x = dx_0 \quad b_y = dy_0 \]
\[ c_x = x_0 \quad c_y = y_0 \]
\[ x_t = a_x t^2 + b_x t + c_x \quad y_t = a_y t^2 + b_y t + c_y \quad (t=0\ldots1) \]

note: \( dx_0 \) and \( dy_0 \) should be scaled for greater curvature

cubic parameterized (bezier)

\[ a_x = 2x_0 - 2x_1 + dx_0 + dx_1 \]
\[ b_x = -3x_0 + 3x_1 - 2dx_0 - dx_1 \]
\[ c_x = dx_0 \]
\[ d_x = x_0 \]
\[ x_t = a_x t^3 + b_x t^2 + c_x t + d_x \quad (t=0\ldots1) \]

note: \( dx_0, dy_0, dx_1 \) and \( dy_1 \) should be scaled for greater curvature