

Systematic Calculation of Loop Points for Parametric Curves

Skip Thompson
Department of Mathematics & Statistics
Radford University
Radford, VA 24142
thompson@radford.edu

Other examples that are not included in the paper.

Example 6 (4 loop points). For $0 \leq t \leq 2\pi$,

$$x(t) = \cos(4t) \cos(t)$$

$$y(t) = \sin(4t) \sin(t)$$

Example 7 (2 loop points). For $0 \leq t \leq 2\pi$,

$$x(t) = t + \sin(2t)$$

$$y(t) = t + \sin(3t)$$

Example 8 (1 loop point). For $-1 \leq t \leq 1.75$,

$$x(t) = t^3 - 2t$$

$$y(t) = t^2 - t$$

Example 9 (3 loop points). For $-1 \leq t \leq 2$,

$$x(t) = \sin(t^3 - 2t)$$

$$y(t) = \cos(t^2 - t)$$

Example 10 (3 loop points). For $0 \leq t \leq 2\pi$,

$$x(t) = e^{\sin(t) - 2 \cos(4t)} \cos(t)$$

$$y(t) = e^{\sin(t) - 2 \cos(4t)} \sin(t)$$

Example 11 (7 loop points). For $-5.2 \leq t \leq 5.7$,

$$x(t) = (t + \cos(2t)) \cos(t)$$

$$y(t) = (t - \sin(4t)) \sin(t)$$

Example 12 (3 loop points). For $0 \leq t \leq \frac{3}{2}\pi$,

$$x(t) = \sin(4t) \cos(t)$$

$$y(t) = \sin(3t) \sin(t)$$

Example 13 (3 loop points). For $-4 \leq t \leq 4$,

$$x(t) = t(9 - t^2)$$

$$y(t) = (t^2 - 1)(t^2 - 9)$$

Example 14 (3 loop points). For $-4 \leq t \leq 4$,

$$x(t) = (t - 0.2)(3.1 - 1.05t)(3.2 + t) - 1.5$$

$$y(t) = (t - 1.2)(t + 1.1)(t - 2.9)(t + 3) + 1$$