

*"Finding Nirvana is like locating silence."*

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In class work **25** has questions **1** through **3** with a total of **6** points. Turn in your work at the end of class *on paper*. This assignment is due at *Tuesday 30 April 13:20*.

Define a curve  $\mathcal{C} = \begin{cases} x = \text{sign}(t)\sqrt{|t|}\cos(|t|) \\ y = \text{sign}(t)\sqrt{|t|}\sin(|t|) \end{cases} \quad t \in [-3\pi, 3\pi]$ . The function sign is de-

fined as  $\text{sign}(x) = \begin{cases} -1 & x < 0 \\ 0 & x = 0 \\ 1 & x > 0 \end{cases}$ . Wikipedia tells me that this curve has been used for an

"efficient layout for the mirrors of concentrated solar power plants."

- 2 1. Ask Desmos to draw  $\mathcal{C}$ . As best you can, reproduce the curve here.

- 2 2. Find  $\left. \frac{dy}{dx} \right|_{t=\pi/2}$

2 3. Find  $\left. \frac{d^2 y}{dx^2} \right|_{t=\pi/2}$