

SHOW ALL WORK!!! Unsup

Problem 1 [6 pts] A parametric representation for a certain curve is given by:

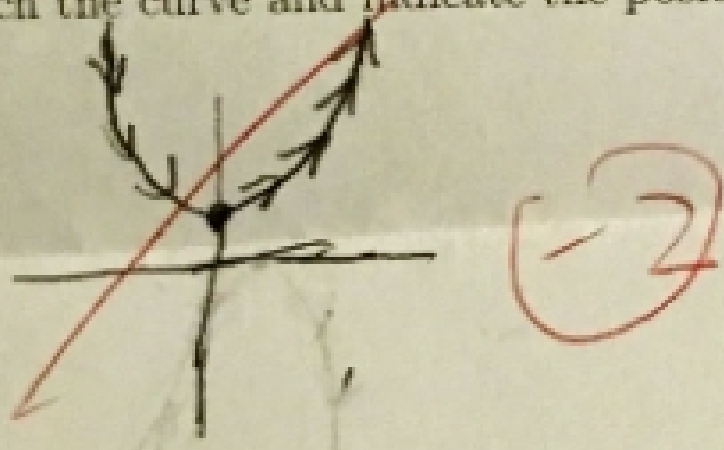
$$\begin{cases} x(t) = 2 \sin t \\ y(t) = 1 - 2 \cos t \end{cases}$$

a) [2 pts] Eliminate the parameter to find a description of the curve in terms of x, y .

$$\left(\frac{x}{2}\right)^2 - \left(\frac{y-1}{2}\right)^2 = \sin^2 t + \cos^2 t$$

$$\frac{x^2}{4} - \frac{(y-1)^2}{4} = 1$$

b) [2 pts] Sketch the curve and indicate the positive orientation.



c) [2 pts] Find the slope of the tangent line to the curve when $t = \frac{\pi}{4}$.

$$= \frac{1 - 2 \cos t}{2 \sin t}$$

$$\frac{dy}{dx} = \frac{2 \sin t}{2 \cos t}$$

$$\frac{\sin t}{\cos t}$$

$$\frac{\sqrt{2}/2}{\sqrt{2}/2} = 1$$