Name: _____ ID: _____

1. Consider the curve defined by the parametric equations

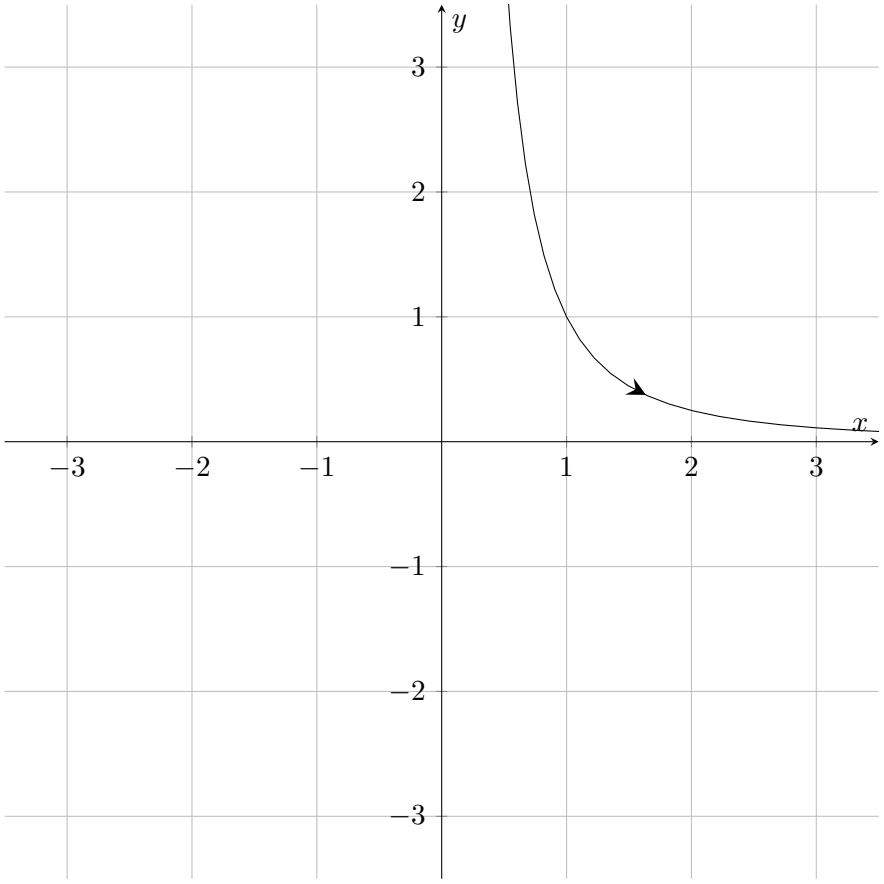
$$x = e^t, \qquad y = e^{-2t}.$$

(a) Eliminate the parameter to find a Cartesian equation of the curve.

Solution: Properties of exponentials tells us that $e^{-2t} = \left(e^t\right)^{-2}$, so, substituting, we have $y = x^{-2}$.
Alternatively, $t = \ln x$, so $y = e^{-2\ln x} = x^{-2}$.

(b) Sketch the curve and indicate with an arrow the direction in which the curve is traced as the parameter increases.

Solution: We sketch $y = x^{-2}$. However, we only include the part of the curve in the first quadrant, because $x = e^t$ is always positive. As t increases, $x = e^t$ increases, whereas $y = e^{-2t}$ decreases, which tells us which direction to draw our arrow.



2. Plot and label these four points with given polar coordinates.

Point	(r, θ)
A	$(1, 5\pi/4)$
B	$(2, 3\pi)$
C	$(2, -2\pi/3)$
D	$(-3, 3\pi/4)$