Exercise 16

For the following exercises, sketch the parametric equations by eliminating the parameter. Indicate any asymptotes of the graph.

$$x = \ln(2t), \quad y = t^2$$

Solution

Exponentiate both sides of the equation for x in order to solve for t.

$$e^x = e^{\ln(2t)}$$

$$e^x = 2t$$

$$t = \frac{e^x}{2}$$

As a result,

$$y = t^2$$

$$= \left(\frac{e^x}{2}\right)^2$$

$$= \frac{e^{2x}}{4}.$$

Below is a plot of the parametric equations for $0 \le t \le 1$.