Exercise 18

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

$$x = e^{-2t}, \quad y = e^{3t}$$

Solution

The equation for y becomes

$$\begin{aligned} y &= e^{3t} \\ &= e^{-(-2t)\left(\frac{3}{2}\right)} \\ &= (e^{-2t})^{-3/2} \\ &= x^{-3/2}. \end{aligned}$$

Because x is never negative, this is only the right half of a parabola. Below is a plot of the parametric equations for $-0.8 \leq t \leq 0.7$.