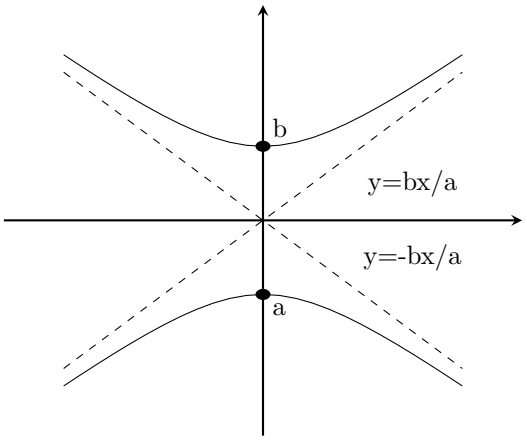
EXAMPLE Find the area between the branches of the hyperbola $y^2 - x^2 = 4$ for $0 \leq x \leq 1$.

$$\Rightarrow y^2 = 4 + x^2 = \begin{cases} \sqrt{x^2+4} & for \quad y < 0 \\ -\sqrt{x^2+4} & for \quad y \geq 0 \end{cases} = \begin{cases} x = a\sinh t \\ y = a\cosh t \end{cases}$$

General hyperbola: $y^2/b^2 - x^2/a^2 = 1$



And we could solve this by paramaterizing the equation or using a substitution. Both hyperbolic.

We are definitely going to be expected to know hyperbolic properties, such as $\sinh 2t = 2\sinh t \cosh t$. These are similar to their trigonometric counterparts.