

# Dr Oliver Mathematics

## Asymptotes: Part 1

1. What are the asymptotes of the graph of the parametric equations

$$x = \frac{1}{t}, y = \frac{t}{t+1}, t \in \mathbb{R}, t \neq -1, t \neq 0?$$

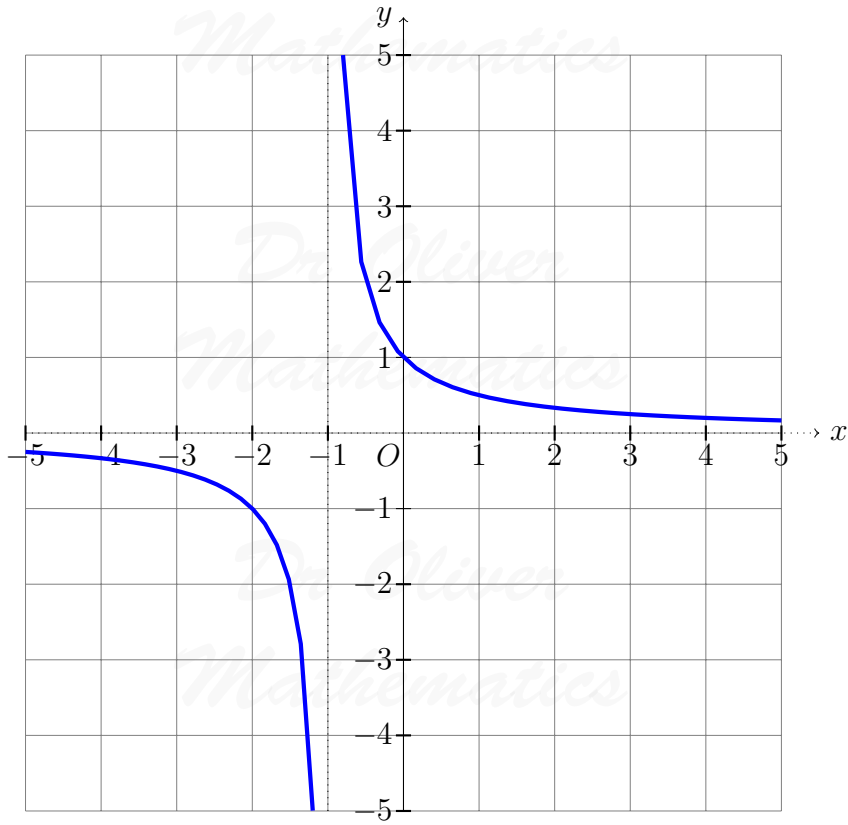
**Solution**

$$\begin{aligned} y &= \frac{t}{t+1} \\ &= \frac{\frac{1}{x}}{\frac{1}{x} + 1} \\ &= \frac{\frac{1}{x}}{\frac{1}{x} + 1} \times \frac{x}{x} \\ &= \frac{1}{1+x}. \end{aligned}$$

Hence, it is  $y = \frac{1}{x}$  shifted one unit to the left in the  $x$ -direction.

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Hence, the asymptotes are

$x = -1$  and  $y = 0$ .

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