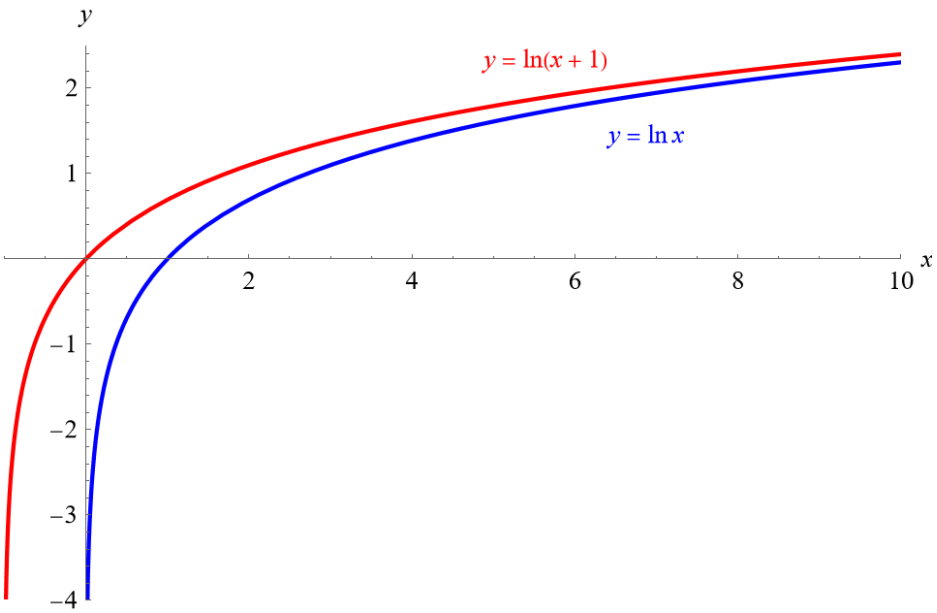
Exercise 269

For the following exercises, sketch the graph of the logarithmic function. Determine the domain, range, and vertical asymptote.

$$f(x) = \ln(x+1)$$

Solution

Changing the argument from x to $x+1$ translates the entire graph to the left by 1 unit.



The argument of a logarithm must be greater than zero.

$$x+1 > 0$$

$$x > -1$$

$$\begin{aligned} \text{Domain:} \quad & \{x \mid x > -1\} \\ \text{Range:} \quad & \{y \mid -\infty < y < \infty\} \\ \text{Vertical Asymptote:} \quad & x = -1 \end{aligned}$$