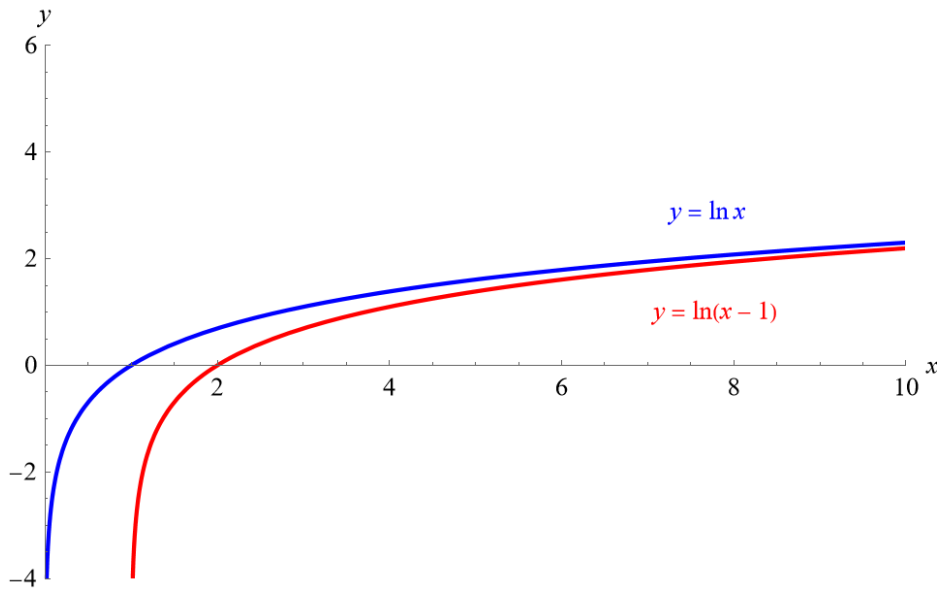
Exercise 265

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 right by 1 unit.



The argument of a logarithm must be greater than zero.

$$x - 1 > 0$$

$$x > 1$$

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