**7.*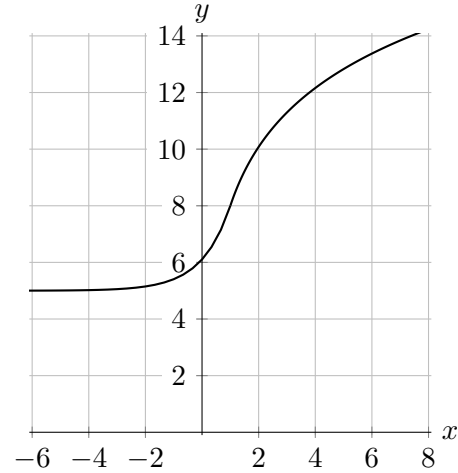* [6 points] Consider the piecewise-defined function $k(x)$ given below. A portion of the graph of $k(x)$ is also shown for reference.

$$k(x) = \begin{cases} 3e^{x-1} + 5 & x < 1 \\ 3\ln(x) + 8 & x \geq 1 \end{cases}.$$

Find a formula for $x = k^{-1}(y)$. Be sure to **show your work**.

Answer: $k^{-1}(y) = \begin{cases} \underline{\hspace{4cm}} & \text{for } \underline{\hspace{3cm}} \\ \\ \underline{\hspace{4cm}} & \text{for } \underline{\hspace{3cm}} \end{cases}$