8. The function \( L(x) = \frac{1}{\ln(x)} \) is differentiable over its domain.

(a) (2 points) What is the domain of \( L \)?

(b) (4 points) Write the formula for the derivative of \( L \) at \( x = a \) using the limit definition of the derivative.

(c) (4 points) Given \( \frac{dL}{dx}|_{x=2} = -1.0407 \) and \( \frac{dL}{dx}|_{x=2.5} = -0.4764 \) and given that the derivative is monotonic (meaning the derivative does not change behavior from decreasing to increasing or vice versa) for all \( x > 1 \), what does this information tell you about the graph of \( L \) for \( x \) near 2? Explain your reasoning using words and symbols (i.e., not by drawing a graph).