5. [12 points] Consider the function

\[ f(x) = (x - k)e^{-x/k} \]

where \( k \) is a positive constant. Note that the derivative of \( f(x) \) is

\[ f'(x) = e^{-x/k} - \frac{1}{k}(x - k)e^{-x/k}. \]

Your answers to this problem might involve the constant \( k \).

**Be sure to show all your work and justify all of your answers.**

a. [7 points] Determine the global maximum and minimum values of \( f(x) \) on the interval \([0, \infty)\). If \( f(x) \) does not have a global maximum or a global minimum on this interval, explain why.

b. [5 points] Find the \( x \)-coordinates of all inflection points of \( f(x) \) on the domain \([0, \infty)\) or show that \( f(x) \) does not have any inflection points on this interval.