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.