2. [8 points] Throughout this problem, let $K(x) = e^x - ex$. In case it is helpful, $e \approx 2.7$.

   a. [1 point] Find a formula for $K'(x)$.

Answer: $K'(x) =$ _____

   b. [4 points] Find the x-coordinate of all global minimum(s) and global maximum(s) of $K(x)$ **on the interval** $[0, 3]$. If there are none of a particular type, write NONE. Use calculus to find your answers, and make sure that you <u>show enough evidence</u> to justify your conclusions.

Answer: Global min(s) at $x =$ _____

Answer: Global max(es) at $x =$ _____

   c. [2 points] Find the linear approximation $L(x)$ of the function $K(x)$ at the point $x = 0$.

Answer: $L(x) =$ _____

   d. [1 point] If you were to use the linear approximation that you found in part c. to estimate $K(0.1)$, would the approximation give you an *underestimate* or *overestimate* of the true value of $K(0.1)$? Circle the correct answer, or circle NEI if there is not enough information to decide.

        UNDERESTIMATE   OVERESTIMATE   NEI