9. [11 points] A continuous function $w(x)$ and its derivative $w'(x)$ are given by

$$w(x) = \begin{cases} x^2(3x^2+10x-9) & x \leq 1 \\ -2\ln(3x-2)+4 & x > 1 \end{cases} \qquad \text{and} \qquad w'(x) = \begin{cases} 6x(x+3)(2x-1) & x < 1 \\ \dfrac{-6}{3x-2} & x > 1. \end{cases}$$

a. [2 points] Find the x-coordinates of all critical points of $w(x)$. If there are none, write NONE. You do not need to justify your answer.

Answer: Critical point(s) at $x =$ ____________________________

For each part below, you must use calculus to find and justify your answers. Make sure your final conclusions are clear, and that you show enough evidence to justify those conclusions.

b. [4 points] Find the x-coordinates of all global minima and global maxima of $w(x)$ **on the interval** $(-\infty, 0)$. If there are none of a particular type, write NONE.

Answer: Global min(s) at $x =$ ____________ and Global max(es) at $x =$ ____________

c. [5 points] Find the x-coordinates of all global minima and global maxima of $w(x)$ **on the interval** $\left[-1, \frac{e+2}{3}\right]$. If there are none of a particular type, write NONE.
In case it is useful, note that $1 < \frac{e+2}{3} < 2$.

Answer: Global min(s) at $x =$ ____________ and Global max(es) at $x =$ ____________