6. [9 points] In this problem, we consider the function $f(x) = 4xe^{-x^2/8}$. In case it is helpful, recall that $e \approx 2.7$. The first derivative of $f(x)$ is given by:

$$f'(x) = (4 - x^2)e^{-x^2/8}.$$

For each part of this problem, **be sure you show enough evidence** to support your conclusions.

a. [5 points] Find the x-coordinates of all critical points of $f(x)$ on $(-\infty, \infty)$. Find the x-coordinates of the local maxima and local minima of $f(x)$, or write NONE in the appropriate blank if there are none of the specified type.

Answer: Critical point(s): $x =$ _____

Answer: Local Max(es): $x =$ _____   Local Min(s): $x =$ _____

b. [4 points] Find the global maximum and minimum of $f(x)$ on $[1, \infty)$, or write NONE if there is no global extremum of that type. Give both the x-value(s) where $f(x)$ achieves the global max/min and the value of $f(x)$ at that x-value.

Answer: $f(x)$ has a global max value of $y =$ _____   occurring at $x =$ _____

Answer: $f(x)$ has a global min value of $y =$ _____   occurring at $x =$ _____