

2. [10 points] Let a be a constant with $a > 1$.

A function $w(x)$ and its derivative $w'(x)$ are given below.

$$w(x) = a + \frac{x}{x^2 + a^2} \quad \text{and} \quad w'(x) = \frac{-(x-a)(x+a)}{(x^2 + a^2)^2}.$$

- a. [5 points] Find and classify the local extrema of $w(x)$. Use calculus to find and justify your answers, and be sure to show enough evidence to demonstrate that you have found all local extrema. For each answer blank, write NONE if appropriate.

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

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

- b. [5 points] Find the global extrema of $w(x)$ on the interval $[1, \infty)$. Use calculus to find and justify your answers, and be sure to show enough evidence to demonstrate that you have found the global extrema. For each answer blank, write NONE if appropriate.

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

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