

5. [10 points] As a software engineer, Tendai spends many hours every day writing code. Let $w(t)$ be a function that models the number of lines of code that Tendai writes in a day if he works t hours that day. Tendai works at least one hour and at most 18 hours each day. A formula for $w(t)$ is given by

$$w(t) = \begin{cases} -2t^2 + 28t & \text{if } 1 \leq t \leq 3 \\ -0.5t^2 + 9t + 43.5 & \text{if } 3 < t \leq 18. \end{cases}$$

- a. [8 points] Find the values of t that minimize and maximize $w(t)$ on the interval $[1, 18]$. Use calculus to find your answers, and be sure to show enough evidence that the points you find are indeed global extrema. For each answer blank, write NONE if appropriate.

Answer: global max(es) at $t =$ _____

Answer: global min(s) at $t =$ _____

- b. [2 points] What is the largest number of lines of code that Tendai can expect to write in a day according to this model?

Answer: _____