8. [8 points] At Happy Hives Bee Farm, the population of bees, in thousands, t months after the farm opens, can be modeled by $g(t)$, where

$$g(t) = \begin{cases} 20 + \frac{1}{3}e^{4-t} & \text{for } 0 \le t \le 4 \\ -\frac{1}{6}t^3 + \frac{9}{4}t^2 - 7t + 23 & \text{for } 4 < t \le 8 \end{cases}$$

and

$$g'(t) = \begin{cases} -\frac{1}{3}e^{4-t} & \text{for } 0 < t < 4 \\ -0.5(t-2)(t-7) & \text{for } 4 < t < 8. \end{cases}$$

a. [6 points] Find the values of t that minimize and maximize $g(t)$ on the interval $[0, 8]$. 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 population of bees that occurs in the first 8 months the farm is open?

Answer: _____