9. [9 points] Elphaba and Walt are planning to break out of prison. They would like to escape no later than 20 hours after devising their plan, and they would like to attempt their escape during the noisiest part of the day. Let $N(t)$ be the noise level (in decibels) in the prison t hours after Elphaba and Walt have devised their escape plan.

On the interval $[0, 20]$, a formula for $N(t)$ is given by

$$N(t) = 60 + 1.01^{p(t)} \quad \text{where} \quad p(t) = \frac{1}{3}t^3 - 9t^2 + 56t + 200.$$

a. [8 points] Find the values of t that minimize and maximize $N(t)$ on the interval $[0, 20]$. 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 below, write NONE in the answer blank if appropriate.)

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

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

b. [1 point] As mentioned above, Elphaba and Walt would like to escape no later than 20 hours after devising their plan, and they would like to escape during the noisiest part of the day. When should Elphaba and Walt attempt their escape?

Answer: They should try to escape _____ hours after devising their plan.