**3.** [6 points] Returning to the scenario in the previous problem: a tank is full of a fixed amount of neon gas and the function g(t) gives the temperature of the gas in the tank T (in °C) as a function of t, where t is measured in minutes since a heating source was turned on. Now we learn further that, for some constant c < 0:

$$g(t) = 300 - 250e^{ct}$$

a. [3 points] Assume that the domain for g(t) in this context is  $[0, \infty)$ . In that case, what is the associated range of g(t) and what does this mean in the context of the problem? Show all relevant work.

Range: \_\_\_\_\_

Meaning:

**b.** [3 points] If 30 minutes after the heating source is turned on the temperature of the gas in the tank reaches 200°C, what must be the value of c? Show all work. Leave your answer in exact form.

*c* = \_\_\_\_\_