5. [9 points] As part of an experiment, a new pesticide was used in an apartment building to reduce the population of termites. Let $P(t) = 6e^{-0.8t}$ be the termite population (in thousands) t days after the pesticide was applied.

a. [1 point] What is the continuous growth rate per day of the population of termites given by the function $P(t)$?

Solution: Continuous growth rate$=-0.8$ or -80%.

b. [2 points] Let $G(T)$ be the population of termites (in thousands) T **weeks** after the pesticide was applied. Write down a formula for $G(T)$ only in terms of T.

Solution: $G(T) = P(7T) = 6e^{-5.6T}$.

c. [2 points] Find the growth factor of the function $G(T)$. Your answer must be exact.

Solution: Growth factor of $G(T) = e^{-5.6}$.

d. [4 points] If the concentration of the pesticide is increased, then the termite population (in thousands) t days after the pesticide was applied is given by the function $L(t) = 6e^{-kt}$, where k is a positive number depending on the concentration of the pesticide. The higher the concentration of the pesticide, the more quickly the termite population will decrease.

Indicate if the following statements are True or False. Circle your answer. No explanation is required.

i) The higher the concentration of the pesticide, the bigger the number k will be.

[True] False

ii) The higher the concentration of the pesticide, the smaller the value of $\lim_{t\to\infty} L(t)$ will be.

True [False]