

5. [10 points] While ski jumping, David broke his leg and was taken to the hospital. The hospital doctor administered a painkiller to David at noon. At 3 pm, the concentration of the painkiller in David's blood was 10 mg per liter and at 5 pm, it fell to 6 mg per liter. Let $C(t)$ be the concentration (in mg per liter) of the painkiller in David's blood t hours after noon. Suppose that the function C is decreasing exponentially.
- a. [6 points] Find a formula for $C(t)$. Show all your work. Your answer must be exact.

$$C(t) = \underline{\hspace{2cm}}$$

- b. [4 points] What is the hourly percentage growth rate of $C(t)$ and the initial concentration of painkiller in David's blood? Include units when appropriate. Your answer must be exact or accurate up to one decimal place.

$$\text{Hourly percentage growth rate} = \underline{\hspace{2cm}} \quad \text{Initial concentration} = \underline{\hspace{2cm}}$$

6. [5 points] For each of the following functions, write down its growth factor if the function is exponential or NONE if the function is not exponential.

(i) $f(t) = 2t^3$ Answer = $\underline{\hspace{2cm}}$

(ii) $g(t) = 2^t 3^t$ Answer = $\underline{\hspace{2cm}}$

(iii) $h(t) = (3^{-t})^2$ Answer = $\underline{\hspace{2cm}}$