Question:

Consider the concentration, C, (in mg/liter) of a drug in the blood as a function of the amount of drug given, x, and the time since injection, t. For $0 \leq x \leq 5$ mg and $t \geq 0$ hours, we have

$$C = f(x,t) = 24 \cdot t \cdot e^{-(5-x)t}$$

Find $f(1,3)$.

Solution:

$f(1,3)$ means that we have to find the concentration C of a drug in the blood of the amount given $x = 1$ mg since the time $t = 3$ hours after injection. Therefore, we obtain

$$C = f(1,3) = 24 \cdot 3 \cdot e^{-(5-1)\cdot 3} = 72 \cdot e^{-12} \cong 0.00044 \; \frac{\text{mg}}{\text{liter}}$$

Answer:

$$C = f(1,3) = 72 \cdot e^{-12} \cong 0.00044 \; \frac{\text{mg}}{\text{liter}}$$