

$$N_2(t) = N_2(0) e^{-A_{21}t}$$

The  $\tau$  definition is written in the book like follows:

$$\tau = \frac{1}{N_2(0)} \int_0^{\infty} A_{21} N_2 t \, dt$$

Where did he brought the previous relation from?????

And then he continued to solve the integral this way, to define that  $\tau$  is the inverse of  $A_{21}$  so we can't say he used the relation in the first line in this document to figure the  $\tau$  relation !!!

$$\tau = \int_0^{\infty} A_{21} \left( \frac{N_2}{N_2(0)} \right) t \, dt = \int_0^{\infty} A_{21} e^{-A_{21}t} t \, dt$$

$$\tau = \frac{1}{A_{21}}$$

The question is mentioned in the second text line ...

Thank you for reading