* Solusi pers. keadaan

PD: $\frac{dx(t)}{dt} = ax(t)$, $x(0) = X_0$

Dicari solusi $x(t) = ---$?

Analisis :

$$\int \frac{dx(t)}{x(t)} = \int a\,dt = at + C$$

$$\ln[x(t)] = at + C$$

$$e^{\log[x(t)]} = at + C$$

$$x(t) = e^{Kt+C} = e^C e^{at} = A e^{at} \rightarrow \text{Solusi umum}$$

$t=0 \rightarrow x(0) = Ae^0 = A = X_0$

Solusi khusus = $\underline{x(t) = X_0 e^{at}}$ ✓

Check :

* $t=0 \rightarrow x(0) = X_0 e^0 = X_0$ ✓

* $x(t) = X_0 e^{at}$

$$\frac{dx(t)}{dt} = X_0 a e^{at}$$

$$= a\left[X_0 e^{at}\right]$$

$$= a\,x(t)$$ ✓