

Pers. Keadan :

$$\frac{d(x \cdot y)}{dt} = x' \cdot y + x \cdot y'$$

$$\dot{x} = Ax + Bu$$

Misalkan  $x(t) = e^{At} \cdot c(t)$

$$\begin{aligned}\dot{x} = \frac{dx(t)}{dt} &= \frac{d(e^{At})}{dt} \cdot c(t) + e^{At} \cdot \frac{dc(t)}{dt} \\ &= A e^{At} c(t) + e^{At} \frac{dc(t)}{dt}\end{aligned}$$

$$\cancel{Ax} + Bu = \cancel{A} x + [e^{At}] \frac{dc(t)}{dt}$$

$$Bu = [e^{At}] \frac{dc(t)}{dt}$$

$$[e^{At}]^{-1} Bu = \frac{dc(t)}{dt} \rightarrow \int dc(t) = \int [e^{At}]^{-1} Bu(t) dt$$

$$c(t) = \int [e^{At}]^{-1} Bu(t) dt$$

Solusi :

$$x(t) = x_0 e^{At} + \int [e^{At}]^{-1} Bu(t) dt$$