

$$\int x^{-3} dx = -\frac{1}{2} x^{-2}$$

$$\int 1 dx = \int x^0 dx = x \quad \int x^{-2} dx = -x^{-1}$$

$$\int x dx = \frac{1}{2} x^2 \quad \int x^2 dx = \frac{1}{3} x^3$$

Penyelesaian ANALITIK

$$\frac{dx(t)}{dt} = -2x(t), \quad x(0) = 10$$

$$\int \frac{dx(t)}{x(t)} = \int -2 dt = -2 \int dt$$

$$\ln[x(t)] = [-2t + K]$$

$$x(t) = e^{(-2t + K)} = e^K e^{-2t} = A e^{-2t} \quad \leftarrow \text{solusi umum}$$

$$x(0) = A e^{-2(0)} = A e^0 = A = 10$$

Jadi SOLUSI $x(t) = 10e^{-2t}$ $\leftarrow$ solusi khusus

Bukti * Keadaan awal $x(0) = 10e^0 = 10$, OK

* Differential,

$$x(t) = 10e^{-2t} \rightarrow \frac{dx(t)}{dt} = 10 \frac{d[e^{-2t}]}{dt} = 10[-2]e^{-2t} = -2[10e^{-2t}]$$

$$\frac{dx(t)}{dt} = -2x(t), \quad \text{OK}$$