

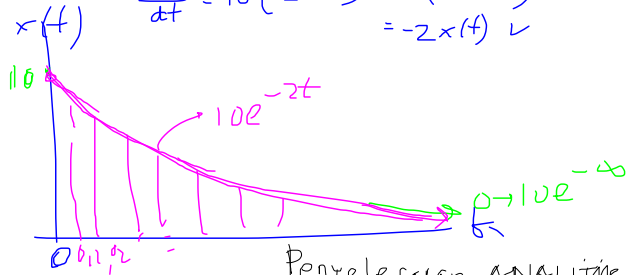
check:

Solusi: $x(t) = 10e^{-2t}$

* Keadaan awal $\rightarrow x(0) = 10e^{-2 \cdot 0} = 10$ ✓ Ok

* Pers. differensial:

$$\frac{dx(t)}{dt} = 10(-2e^{-2t}) = -2(10e^{-2t}) = -2x(t) \checkmark$$



Penyelesaian ANALITIK:

Diketahui: Pers. Differential Biasa (ODE),

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

dengan $x(0) = 10$

Ditanyakan: $x(t) = ?$ (solusi pers. differensial)

Penyelesaian Analitik: (exact)

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

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

$$e^{\ln[x(t)]} = e^{-2t+C} \rightarrow x(t) = e^{-2t+C} = e^C \cdot e^{-2t} = Ae^{-2t}$$

$$e = 2,718 \dots$$

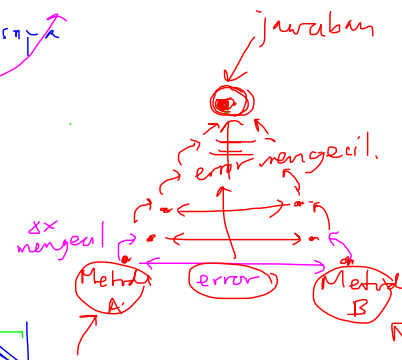
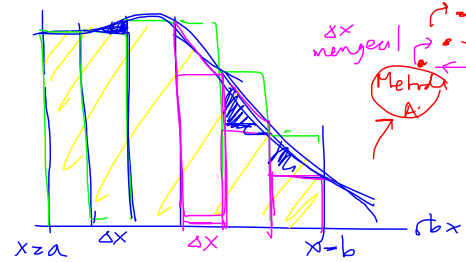
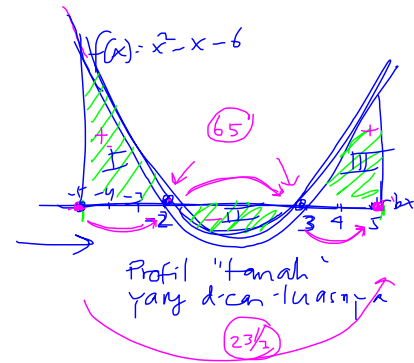
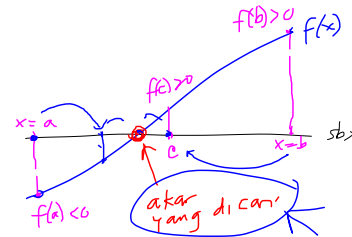
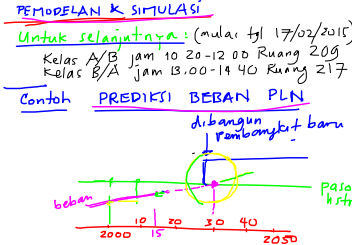
Solusi pers-diff:

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

$$\int dx = x$$

$$\int dt = t$$

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



1st order
 $x(0,1) = 8,0$
 2nd order
 $x(0,1) = 8,2$

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

$$x(0,1) = 8,1873$$