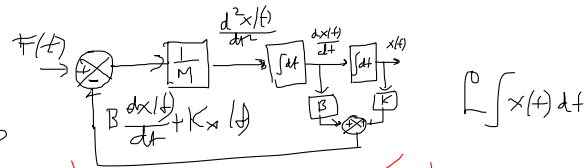
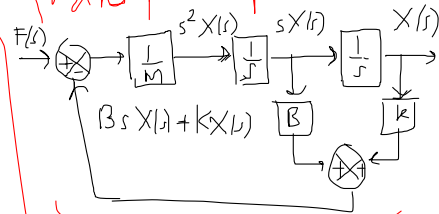


* Bagan Kotalic

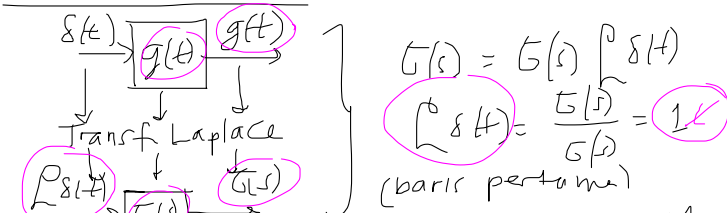
$$\frac{d^2x(t)}{dt^2} = \frac{1}{M} \left[F(t) - \left(B \frac{dx(t)}{dt} + Kx(t) \right) \right] \rightarrow$$



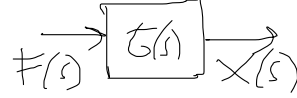
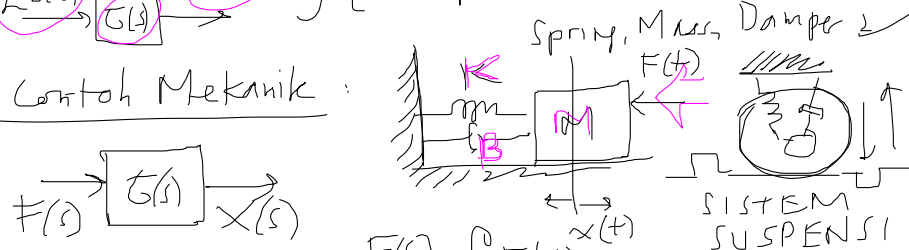
Transf. Laplace



* Contoh Matematis : Tentukan $\mathcal{L}\{\delta(t)\}$! $\rightarrow \mathcal{L}\{\delta(t)\} = 1$



* Contoh Mekanik :



$$G(s) = ???$$

$$F(s) = \mathcal{L}\{F(t)\}$$

$$X(s) = \mathcal{L}\{x(t)\}$$

* Pers. Diferensial

$$F(t) = M \frac{d^2x(t)}{dt^2} + B \frac{dx(t)}{dt} + Kx(t)$$

$$F(s) = \mathcal{L}\{F(t)\} = \mathcal{L}\left[M \frac{d^2x(t)}{dt^2} + B \frac{dx(t)}{dt} + Kx(t)\right]$$

$$= \mathcal{L}\left[M \frac{d^2x(t)}{dt^2}\right] + \mathcal{L}\left[B \frac{dx(t)}{dt}\right] + \mathcal{L}\{Kx(t)\}$$

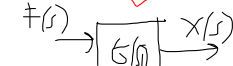
$$= M \mathcal{L}\left[\frac{d^2x(t)}{dt^2}\right] + B \mathcal{L}\left[\frac{dx(t)}{dt}\right] + K \mathcal{L}\{x(t)\}$$

$$= Ms^2X(s) + BsX(s) + KX(s)$$

$$= [Ms^2 + Bs + K]X(s)$$

$$G(s) = \frac{X(s)}{F(s)} = \frac{X(s)}{[Ms^2 + Bs + K]X(s)} = \frac{1}{Ms^2 + Bs + K}$$

RVMT



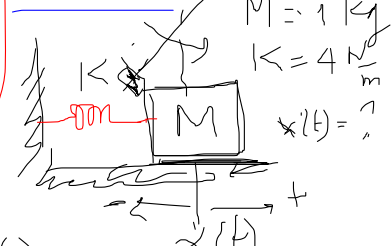
$$s^2X(s) = \frac{1}{M} [F(s) - (BsX(s) + KX(s))]$$

$$F(s) = Ms^2X(s) + BsX(s) + KX(s)$$

$$= [Ms^2 + Bs + K]X(s)$$

$$G(s) = \frac{X(s)}{F(s)} = \frac{1}{Ms^2 + Bs + K}$$

Contoh : Diketahui :



$$F(s) = \mathcal{L}\{F(t)\} = \mathcal{L}\{\delta(t)\} = 1$$

$$X(s) = G(s)F(s)$$

$$= G(s)$$

$$G(s) = \frac{1}{Ms^2 + K}$$

$$= \frac{1}{s^2 + 4}$$