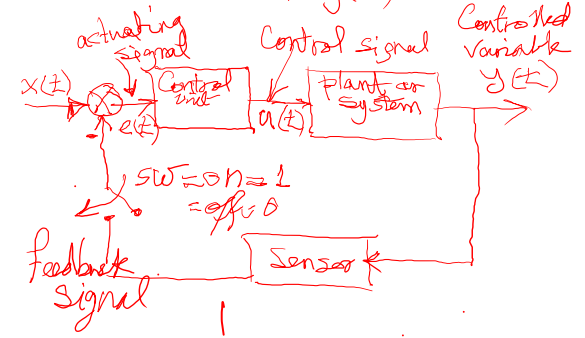


$$e(t) = x(t) - y(t)$$

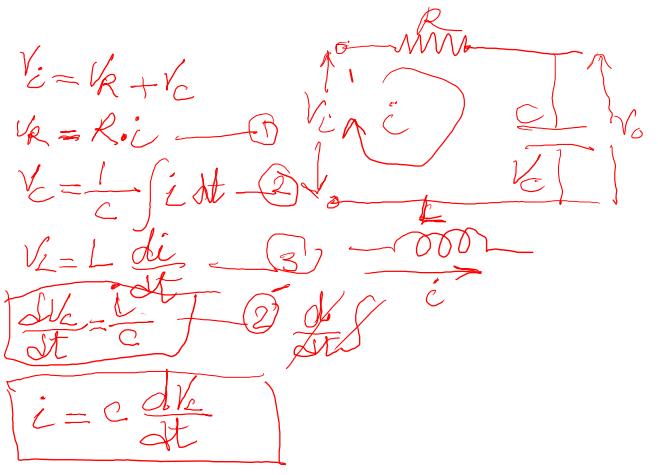


Angular displacement

$$\omega = \frac{d\theta}{dt} = \text{Angular Speed}$$

$$\frac{d^2\theta}{dt^2} = \text{Angular Acceleration} = \frac{d\omega}{dt}$$

$$\frac{d^3y}{dt^3} + 5\frac{d^2y}{dt^2} + 12\frac{dy}{dt} + 3y(t) = \cos(x)$$



$$V_i = V_R + V_C$$

$$V_R = R \cdot i$$

$$V_C = \frac{1}{C} \int i dt$$

$$V_L = L \frac{di}{dt}$$

$$\frac{dV_C}{dt} = \frac{i}{C}$$

$$i = C \frac{dV_C}{dt}$$

$$V_i = i \cdot R + V_C$$

$$V_i = CR \frac{dV_C}{dt} + V_C$$

$$\frac{dV_C}{dt} + \frac{1}{CR} V_C = \frac{1}{CR} V_i$$

$$\frac{dV_C}{dt} + \tau V_C = \tau V_i \cdot \frac{1}{\tau} \quad \tau = CR$$