

$$a_0 \frac{d^2 y}{dt^2} + a_1 \frac{dy}{dt} + a_2 y(t) = x(t)$$



Linear D.E

Linear D.E order 3  
type 0

$$\left\{ \begin{aligned} \frac{d^3 y}{dt^3} + 7 \frac{d^2 y}{dt^2} + 4 \frac{dy}{dt} + 2y &= x(t) \\ a_0 \ddot{y} + a_1 \dot{y} + a_2 y + \frac{1}{3} y &= x(t) \end{aligned} \right.$$

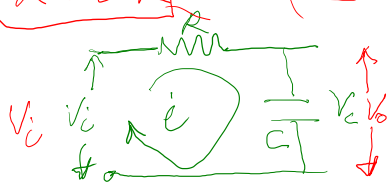
Non Linear D.E order 3  
type 0

$V_c = \frac{1}{C} \int i dt$   $\int$   $L$   
 $V_c = V_R + V_c$   $\int$   
 $V_R = iR$   $V_c = \frac{1}{C} \frac{di}{dt}$

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

Non Linear D.E order 2  
type 1

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



$V_c = \frac{1}{C} \int i dt$   
 $\frac{dV_c}{dt} = \frac{1}{C} i$   
 $\frac{dV_c}{dt} + \frac{V_c}{RC} = \frac{V_i}{RC}$   
 $\frac{dV_c}{dt} + \frac{V_c}{RC} = \frac{V_i}{RC}$

$$RC \frac{dV_c}{dt} + V_c = V_i$$

$$\frac{dV_c}{dt} + \frac{V_c}{RC} = \frac{V_i}{RC}$$

$$\frac{dV_c}{dt} + \frac{V_c}{RC} = \frac{V_i}{RC}$$

$V_c = iR + V_c$   
 $V_c = RC \cdot \frac{dV_c}{dt} + V_c$

