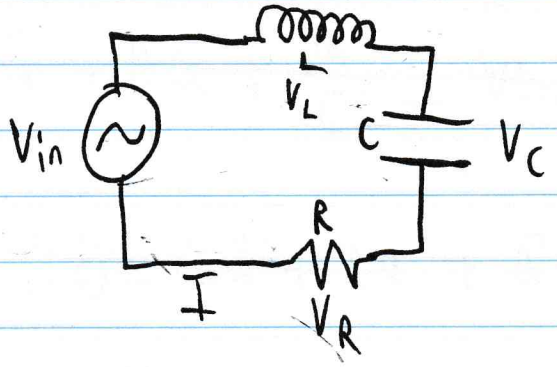
# Unit 2 Lesson 9

- For an RLC circuit of the form




, where $V_k$ is the voltage drop across k, we have

I is the current of the circuit,

L is inductance

R is resistance

C is capacitance

$V_{in}$ is voltage input

$q(t)$ is the charge on the capacitor, etc.

- We have

$V_L = L\dot{I}$

$V_C = Q/C$

$V_R = RI$

- We ~~for~~ are given a few DEs extracted from this scenario:

~~$L\ddot{Q} + R\dot{Q} + \frac{Q}{C} = V_{in}$~~

for

$$P(D) = L\ddot{a} + R\dot{a} + a^{-1}q,$$

$$P(D)\, Q = V_{in}$$

$$P(D)\, I = \dot{V}_{in}$$

$$P(D)\, V_C = \frac{1}{C} V_{in}$$

$$P(D)\, V_r = R\dot{V}_{in}$$

# Example Problem

By experimentation with the mathlet, it seems that capacitance ~~in the range~~ of 50 uf puts inductance and $V_0$ in phase.