(2) Short Circuit Battery

\[ R_{TH} = \frac{R_1 R_2}{R_1 + R_2} \]

(3) Put \( V_{TH} \) and \( R_{TH} \) in series:

\[ I = \frac{V_{TH}}{(R_{TH} + R_L)} \]

\[ V_L = I R_L = \left[ \frac{VR_2 R_L}{R_1 + R_2} \right] \]

\[ \left[ \frac{R_1 R_2}{R_1 + R_2} + \frac{R_1}{R_L} \right] = \left[ \frac{VR_2}{R_L} + (R_1 + R_2) \right] \]

Now let us combine (R), (C) and (L) components.

\[ L \frac{dI}{dt} + RI + \frac{Q}{c} = V \]

Or \( L \frac{d^2I}{dt^2} + R \frac{dI}{dt} + \frac{I}{c} = \frac{dV}{dt} \)

This is analogous to a damped spring:

Mechanical

Mass \((m)\)  
Damping \((a)\)  
Spring Constant  
External Force  
Velocity  
Displacement

Electrical

\( L \)  
\( R \)  
\( \frac{1}{c} \)  
\( V \)  
Current  
Charge