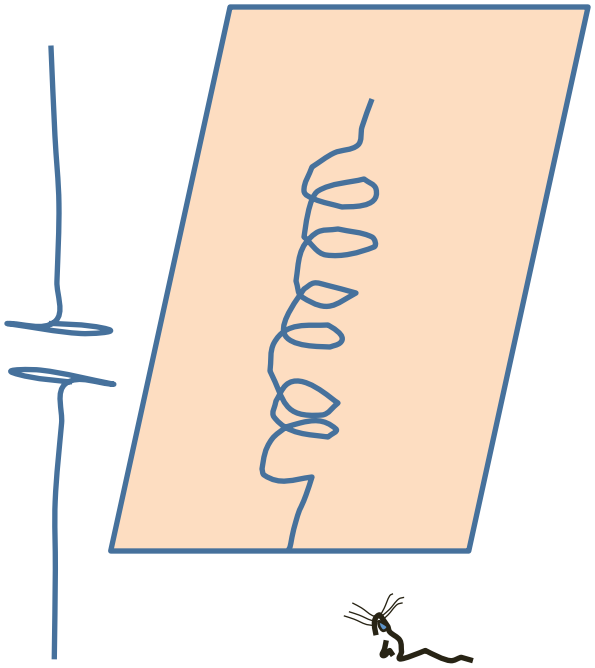
6.002x CIRCUITS AND ELECTRONICS

Inductors and First-Order Systems

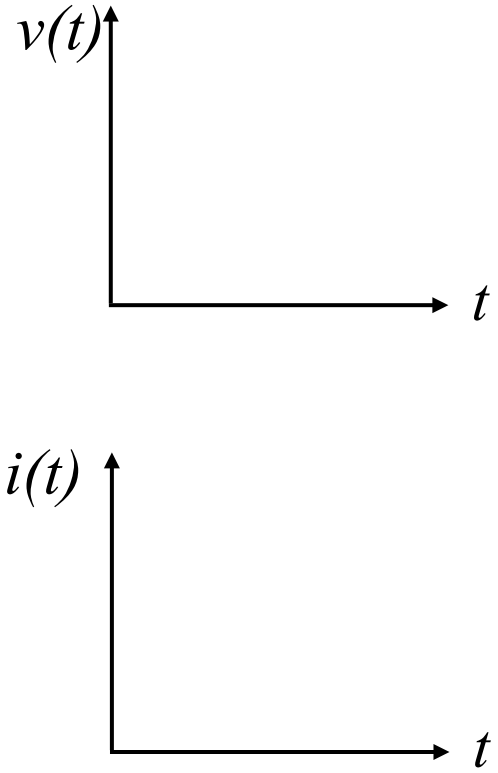


Ideal Linear Inductor

Ideal Linear Inductor

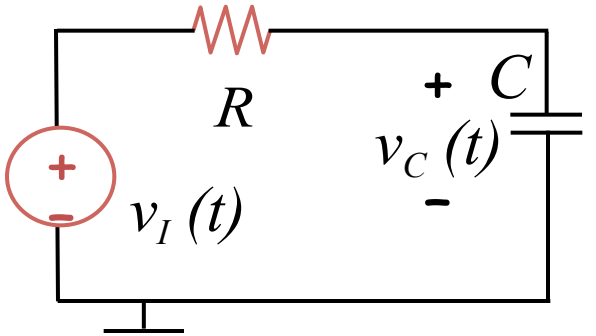
Energy Storage in Inductor

Inductor and a Voltage Source



Analyzing an RL circuit

Let's do an example RL circuit



$$v_I(t) = V_I$$

$$v_C(0) = V_0$$

$$RC\frac{dv_C}{dt} + v_C = V_I$$

Plot Solution

$$v_I(t) = V_I$$

$$v_C(0) = V_0$$

$$RC\frac{dv_C}{dt} + v_C = V_I$$



$$v_C = V_I + (V_0 - V_I)\, e^{\frac{-t}{RC}}$$

