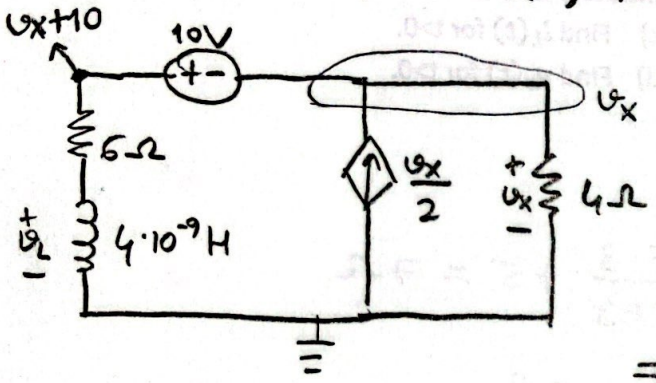
$$\Rightarrow i_L(t) = c\, e^{\frac{-10^9}{18}t}$$

$$i_L(0) = c = 1 \Rightarrow i_L(t) = e^{\frac{-10^9}{18}t} \text{ A.}$$

$$w_L(t) = \frac{1}{2} L i_L^2 = 2\cdot 10^{-9} \cdot e^{\frac{-10^9}{9}t} \text{ J.}$$

$\lim_{t\to\infty} w_L(t) = 0$ J. } The energy stored at the inductor as $t \to \infty$.

In order to find v_x, redraw the circuit.



KCL supernode:

$$\frac{v_x + 10 - v_L}{6} + \frac{v_x}{4} - \frac{v_x}{2} = 0$$

(2) (3) (6)

$$\Rightarrow -v_x + 20 - 2v_L = 0$$

$$\Rightarrow v_x = 20 - 2v_L.$$

$$v_L = L\frac{di_L}{dt} = 4\cdot 10^{-9} \cdot \frac{-10^9}{18} e^{\frac{-10^9}{18}t} = \frac{-2}{9} e^{\frac{-10^9}{18}t} \text{ V.}$$

$$\Rightarrow v_x = 20 - 2v_L = 20 + \frac{4}{9} e^{\frac{-10^9}{18}t} \text{ V.}$$