ANOTHER EXAMPLE   TRY IT ALONE

$R = 2 \, \Omega$

$i(0) = 1 \, A$

$E = 2e^{-t} \, V$

$L = 4H$
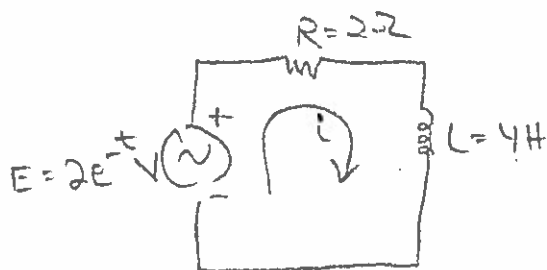
$2e^{-t} - 2i - 4\dfrac{di}{dt} = 0$

$4\dfrac{di}{dt} + 2i = +2e^{-t} \implies \dfrac{di}{dt} + \dfrac{1}{2}i = \dfrac{1}{2}e^{-t}$

LAPLACE $\left[sI(s) - i(0) \right] + \dfrac{1}{2}I(s) = \dfrac{1}{2}\left(\dfrac{1}{s+1}\right)$

$I(s)\left[s + \dfrac{1}{2} \right] - 1 = \dfrac{+\,1/2}{s+1}$

$I(s) = \dfrac{+\,1/2}{(s+1)(s+1/2)} + \dfrac{1}{(s+1/2)}$

$\qquad = \dfrac{A}{s+1} + \dfrac{B}{s+1/2} + \dfrac{1}{s+1/2}$

$A = (s+1)\left. \dfrac{1/2}{(s+1)(s+1/2)}\right|_{s=-1} = -1$

$B = (s+1/2)\left. \dfrac{1/2}{(s+1)(s+1/2)}\right|_{s=-1/2} = 1$

$I(s) = \dfrac{-1}{s+1} + \dfrac{2}{s+1/2}$

$i(t) = -e^{-t} + 2e^{-1/2\,t}$