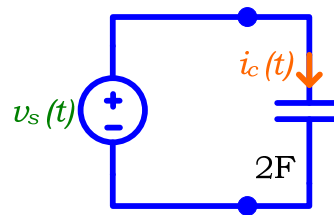## Home Work # 4

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1. The current across a $0.5H$ inductor is given by:

$$i_s = \begin{cases} 0 & t < -1 \ \& \ t \geq 1 \\ 1 - t^2 & -1 \leq t < 1 \end{cases}$$
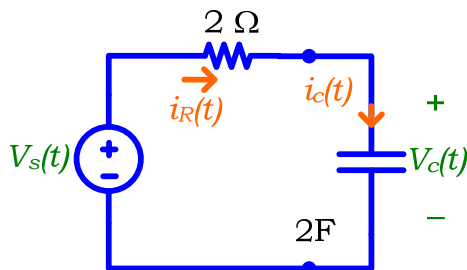
Find: $i_L(t)$, $p(t)$, $w_L(t)$ and plot them.

2. For the circuit shown, if the voltage $v_s(t) = 3e^{-5t}[V]$ for $t \geq 0$,

a. find $i_c(t)$ for $t \geq 0$.
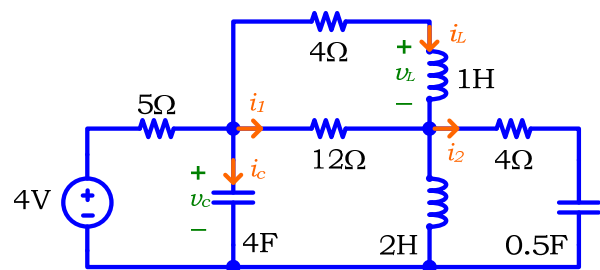
b. find the energy stored in the capacitor for $t \geq 0$.

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3. The voltage across the capacitor in the circuit below is given by:

$$v_c(t) = \begin{cases} 0 & , \quad t \leq 0 \\ 3t & , \quad 5 \geq t > 0 \\ -3t + 30 & , \quad 5 \leq t > 10 \\ 0 & , \quad t > 10 \end{cases}$$
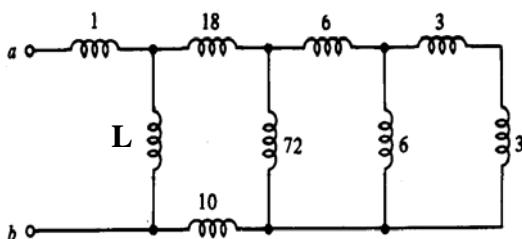
Find: $i_c(t)$, $v_s(t)$ and $w_c(t)$

4. For the circuit shown, calculate the unknown quantities.

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5. If the **value of L** is equal to the equivalent inductance at terminals a & b, **find the equivalent inductance**.

6. In the circuit shown below, what **_value of R_** will make the **energy** stored in the **inductor** and the **capacitor** equal?