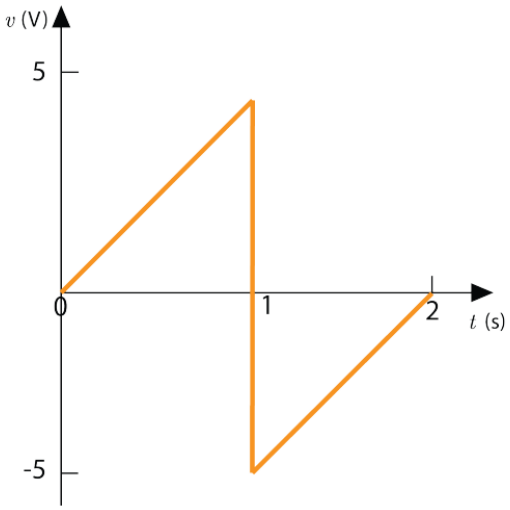
School of Electrical Engineering & Telecommunications

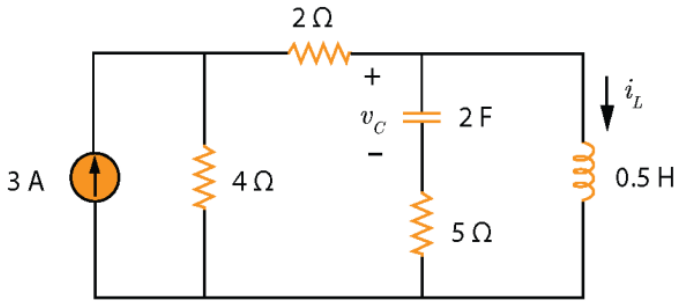
ELEC1111 Online Tutorial

Topic 5: Inductors and RL Circuits

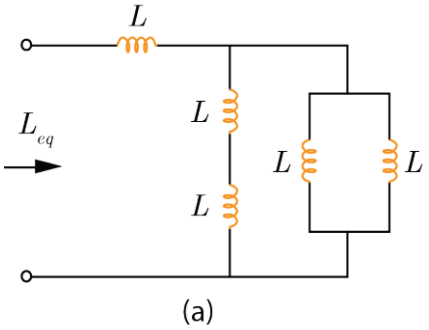
1. The voltage $v_L(t)$ across a 25 mH inductor is given in the following figure. Draw the current waveform across it for $0 \leq t \leq 2$ assuming $i(0) = 0$.



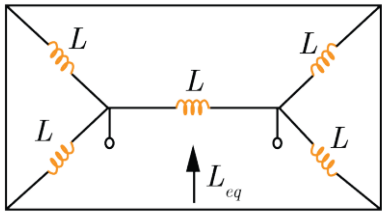
2. Find the energy stored in the inductor *L* and the capacitor *C* of the following circuit under steady state conditions.



3. Calculate the equivalent inductance L_{eq} of the following circuits.

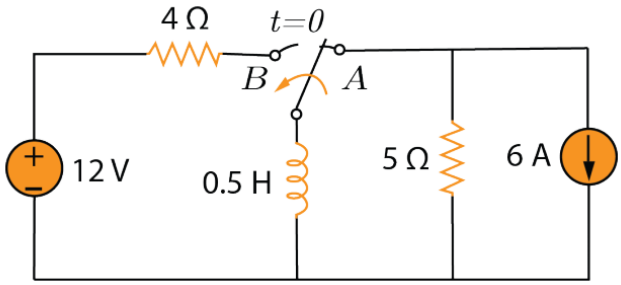


(a)



(b)

4. The switch in the following circuit has been in position A for a long time.



At $t = 0$, the switch moves from position A to B. Calculate:

(a) the current across the inductor $i_L(t)$ for $t > 0$,

(b) the voltage of the inductor after the switch has been moved to position B, and

(c) the voltage across the inductor $v_L(t)$ for $t > 0$.

5. Obtain the inductor current for both $t < 0$ and $t > 0$ in the following circuit.