

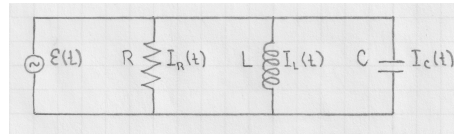
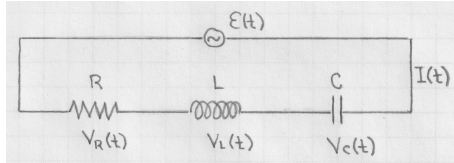
## [lex203] AC circuits I

Consider the  $RLC$  series circuit (left) and the  $RLC$  parallel circuit (right) with the following specifications (as defined in [lam28]):  $V_{\mathcal{E}} = 15\text{V}$ ,  $\omega = 11\text{rad/s}$ ,  $R = 2\Omega$ ,  $L = 0.17\text{H}$ ,  $C = 0.07\text{F}$ .

(a) For the  $RLC$  series circuit find the current amplitude  $I_{\mathcal{E}}$  and the voltage amplitudes  $V_R^{max}$ ,  $V_L^{max}$ ,  $V_C^{max}$  across each device. Establish an algebraic relation between the given  $V_{\mathcal{E}}$  and the found  $V_R^{max}$ ,  $V_L^{max}$ ,  $V_C^{max}$  for the purpose checking your results.

(b) For the  $RLC$  parallel circuit find the amplitude  $I_{\mathcal{E}}$  of the current in the power source and the current amplitudes  $I_R^{max}$ ,  $I_L^{max}$ ,  $I_C^{max}$  in each device. Establish an algebraic relation between the four current amplitudes for the purpose checking your results.

Express all results in SI units.



**Solution:**