Exercises 10
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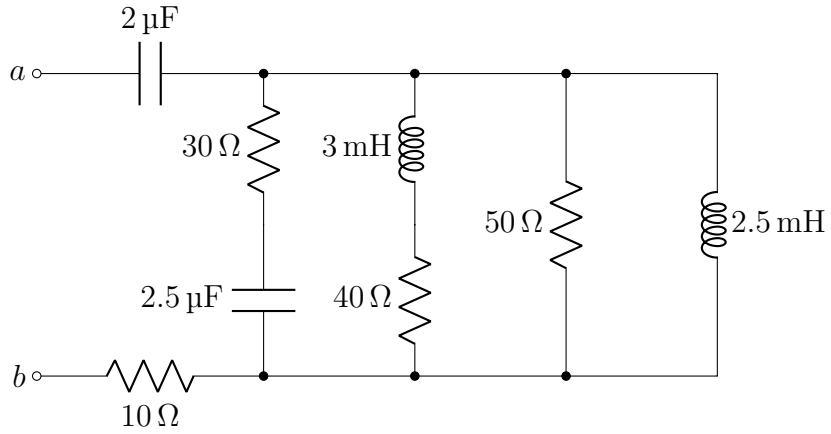
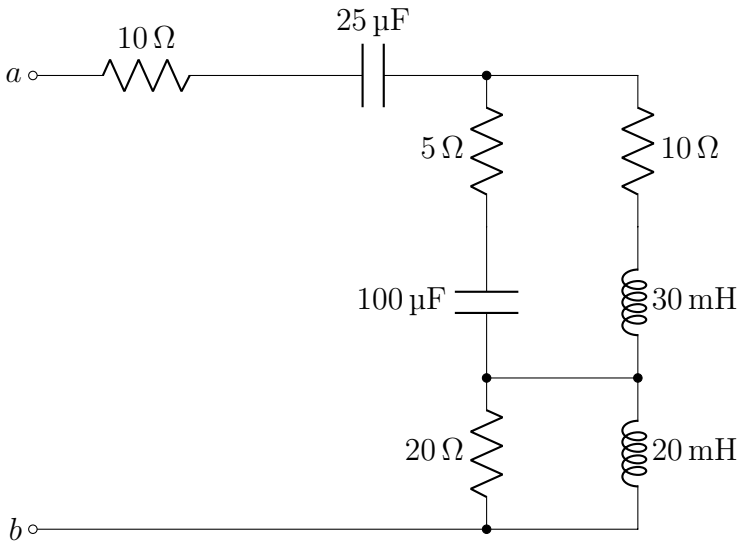
Phasors

Exercise 1 - Equivalent impedance/admittance 1



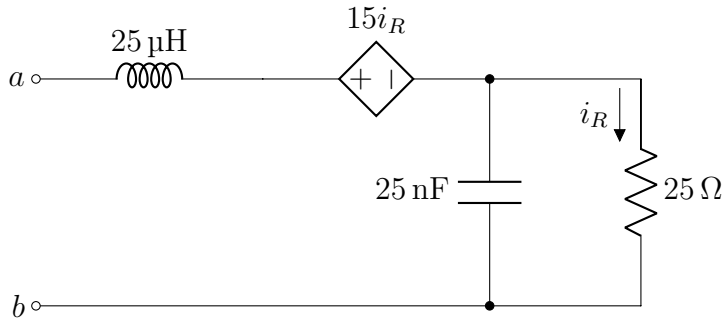
• Determine the equivalent impedance/admittance for an angular frequency $\omega = 10\,000\,\text{rad/s}$.
• If we want the current and voltage for that equivalent impedance to be in phase for that frequency, by which value of capacitance should we change the $2\,\mu\text{F}$ capacitor?

Exercise 2 - Equivalent impedance/admittance 2



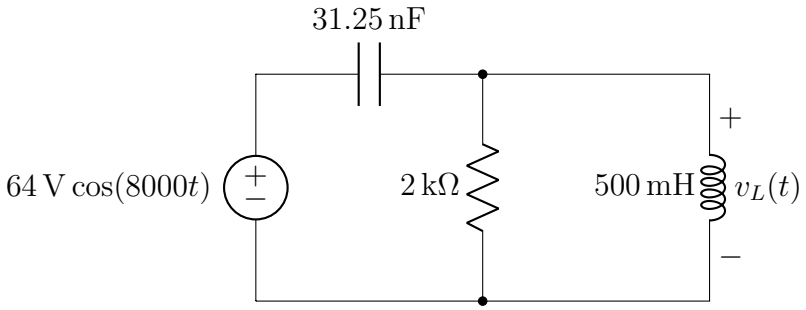
• Determine the equivalent impedance/admittance for an angular frequency $\omega = 1000\,\text{rad/s}$.

Exercise 3 - Equivalent impedance/admittance 2



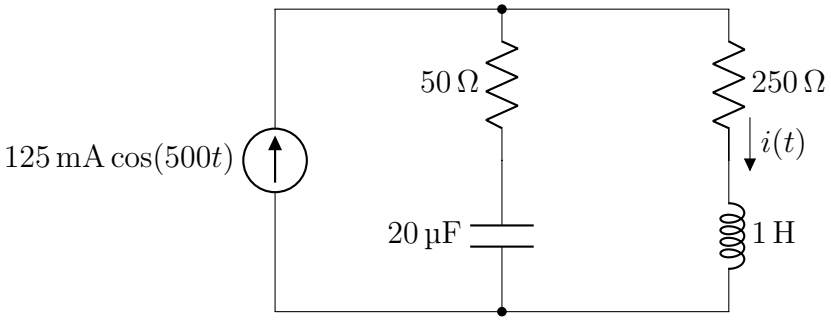
- Determine the equivalent impedance/admittance for an angular frequency $\omega = 1.6\,\text{Mrad/s}$.

Exercise 4 - Circuit 1



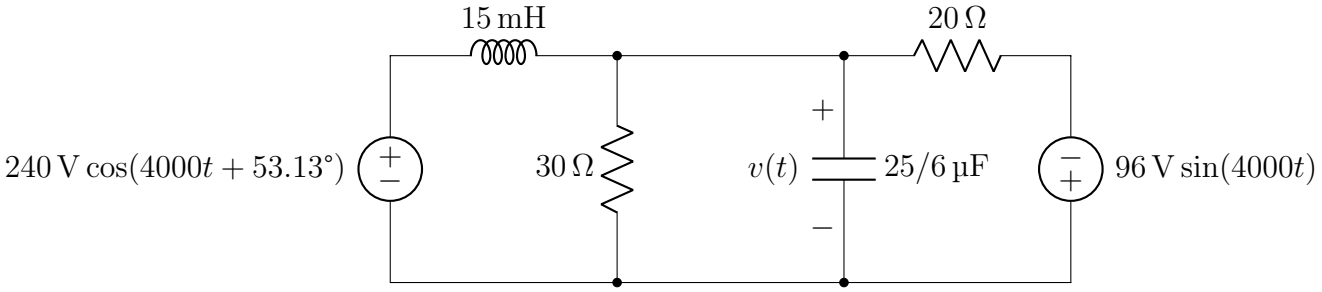
- Determine the steady-state expression for $v_L(t)$.

Exercise 5 - Circuit 2



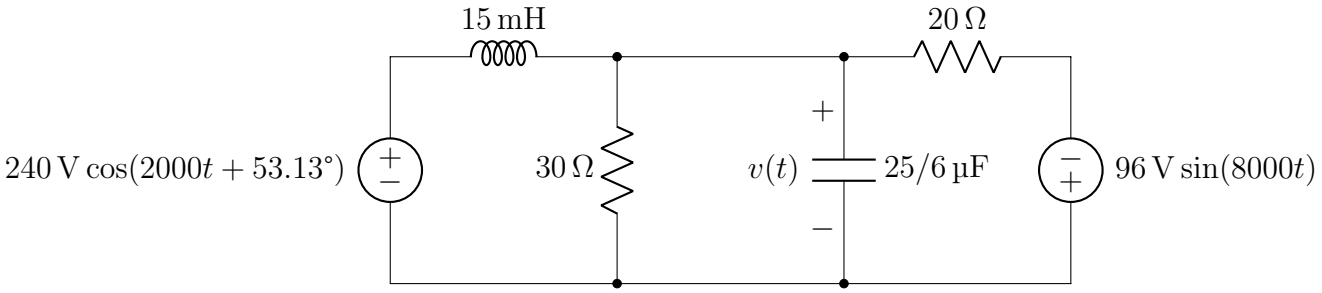
- Determine the steady-state expression for $i(t)$.

Exercise 6 - Source transformation



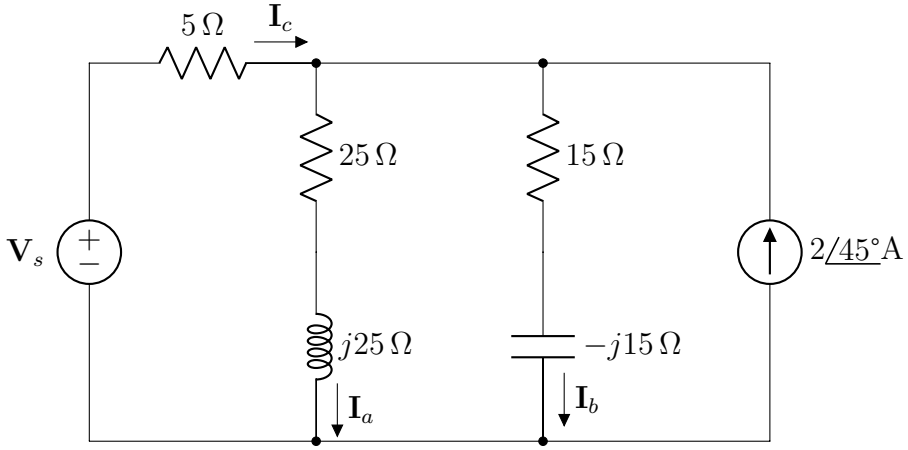
- Using source transformation, determine the steady-state expression for $v(t)$.

Exercise 7 - Superposition



- Using superposition, determine the steady-state expression for $v(t)$.

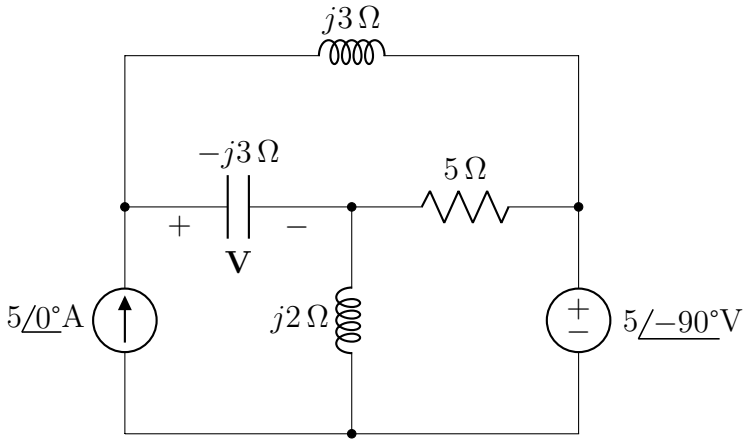
Exercise 8 - Circuit 3



Knowing that $\mathbf{I}_b = 5\angle 45°$A:

- Determine $\mathbf{I}_a$, $\mathbf{I}_c$ and $\mathbf{V}_s$
- For $\omega = 800\,\text{rad/s}$, give the expression for $i_a(t)$, $i_c(t)$ and $v_s(t)$.

Exercise 9 - Circuit 4



- Determine the phasor $\mathbf{V}$.