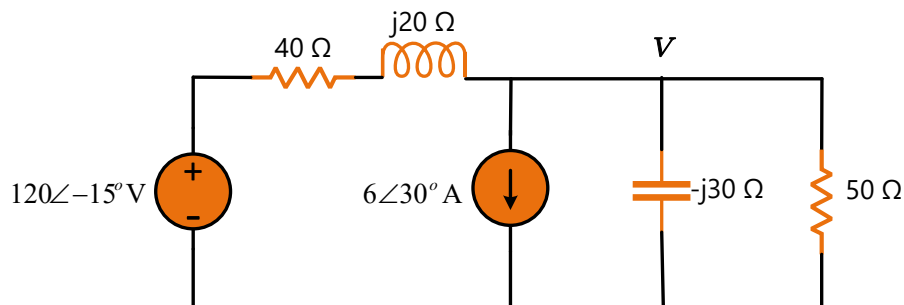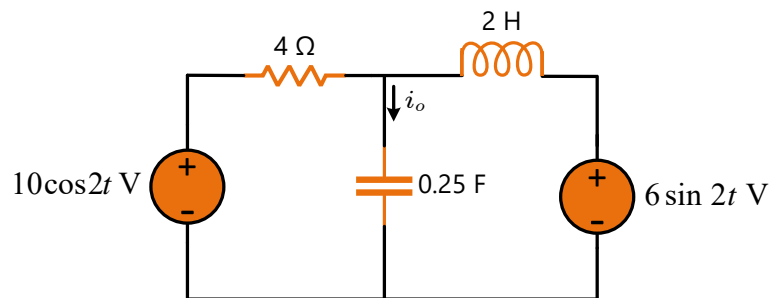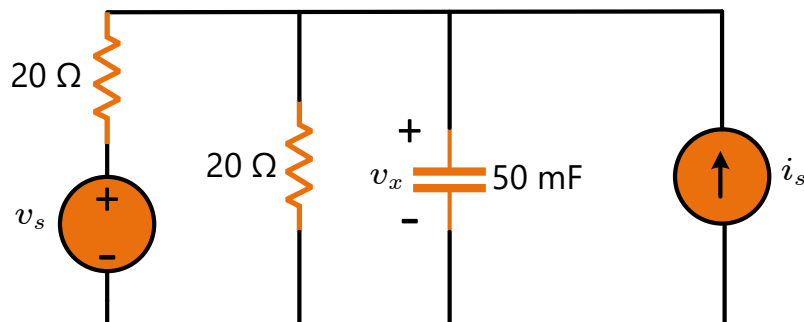1. Using nodal analysis, calculate the voltage $\mathbf{V}$ in the following circuit.
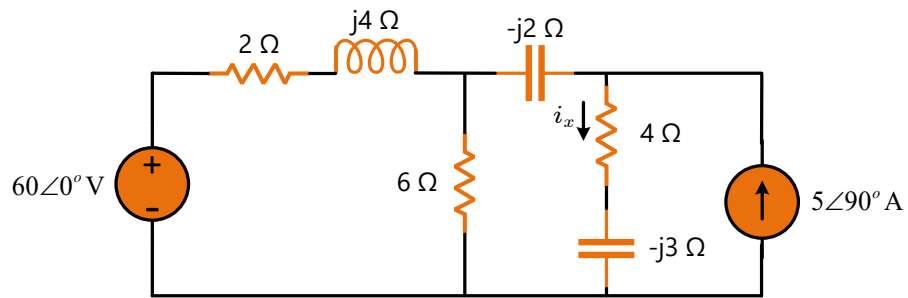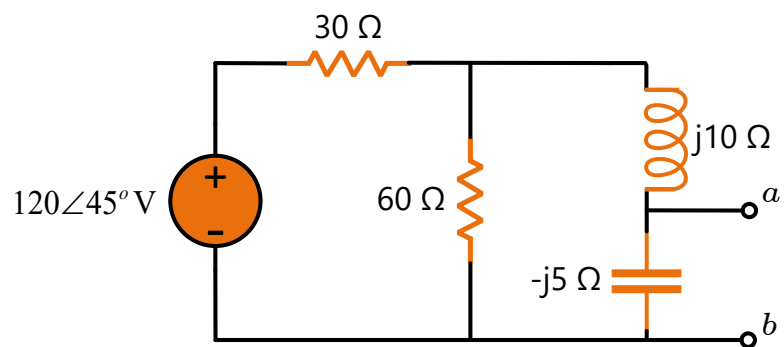

2. Using mesh analysis, calculate i_o in the following circuit.

3. Using the principle of superposition, calculate v_x in the following circuit, if $v_s = 50\sin 2t$ V and $i_s = 12\cos(6t + 10°)$ A.
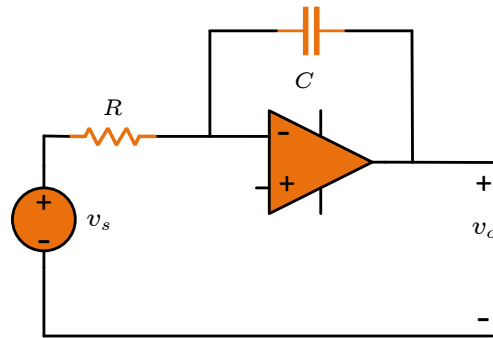
4. Using source transformation, calculate the current $\mathbf{I_x}$ in the following circuit.

5. Calculate the Thevenin and Norton equivalent circuits at terminals a and b of the following circuit.

6. For the integrator of the following figure, calculate $\mathbf{V_o}/\mathbf{V_s}$.

7. Evaluate the voltage gain $\mathbf{A_v} = \mathbf{V_o}/\mathbf{V_s}$ in the following circuit. Find the gain when $\omega = 0$ and when $\omega \to \infty$.