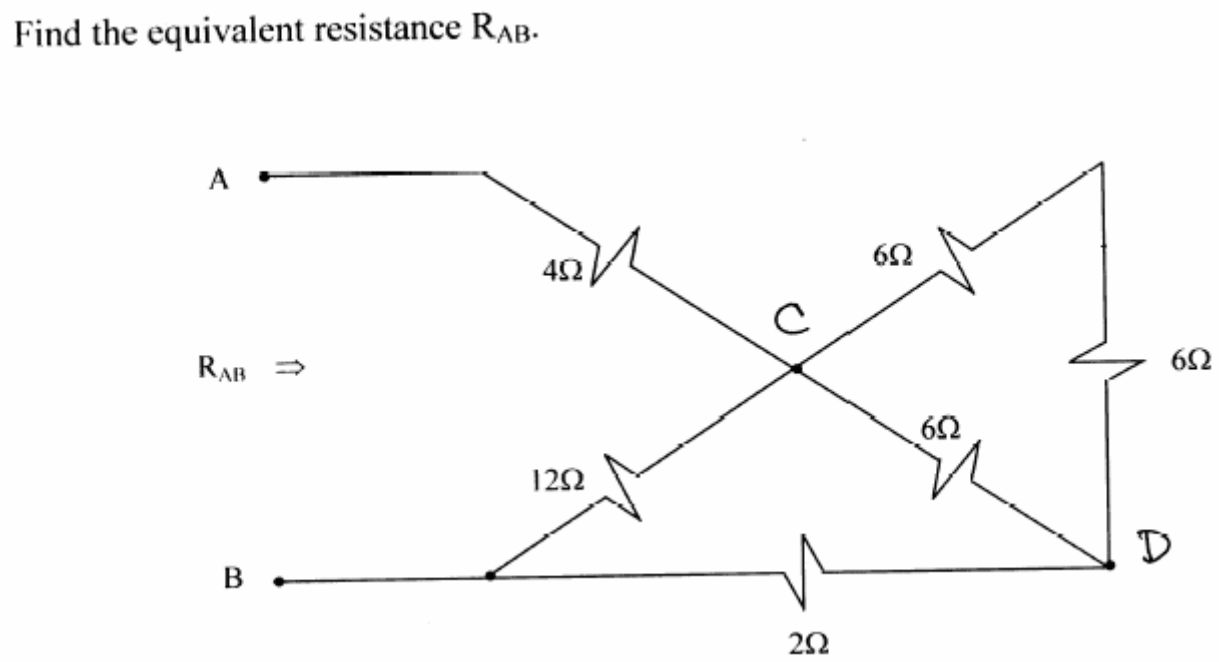
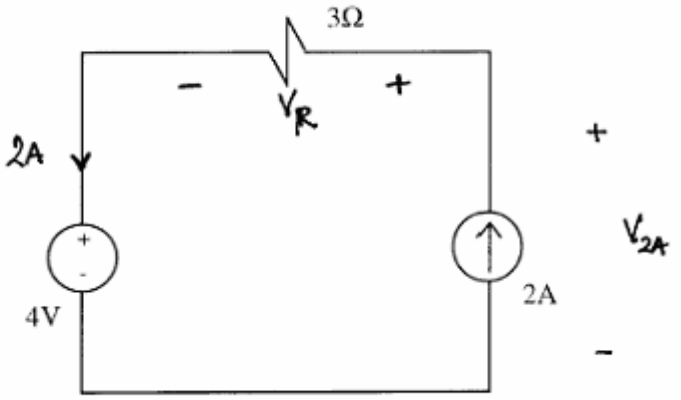
PRACTICE FINAL EXAM: PART I

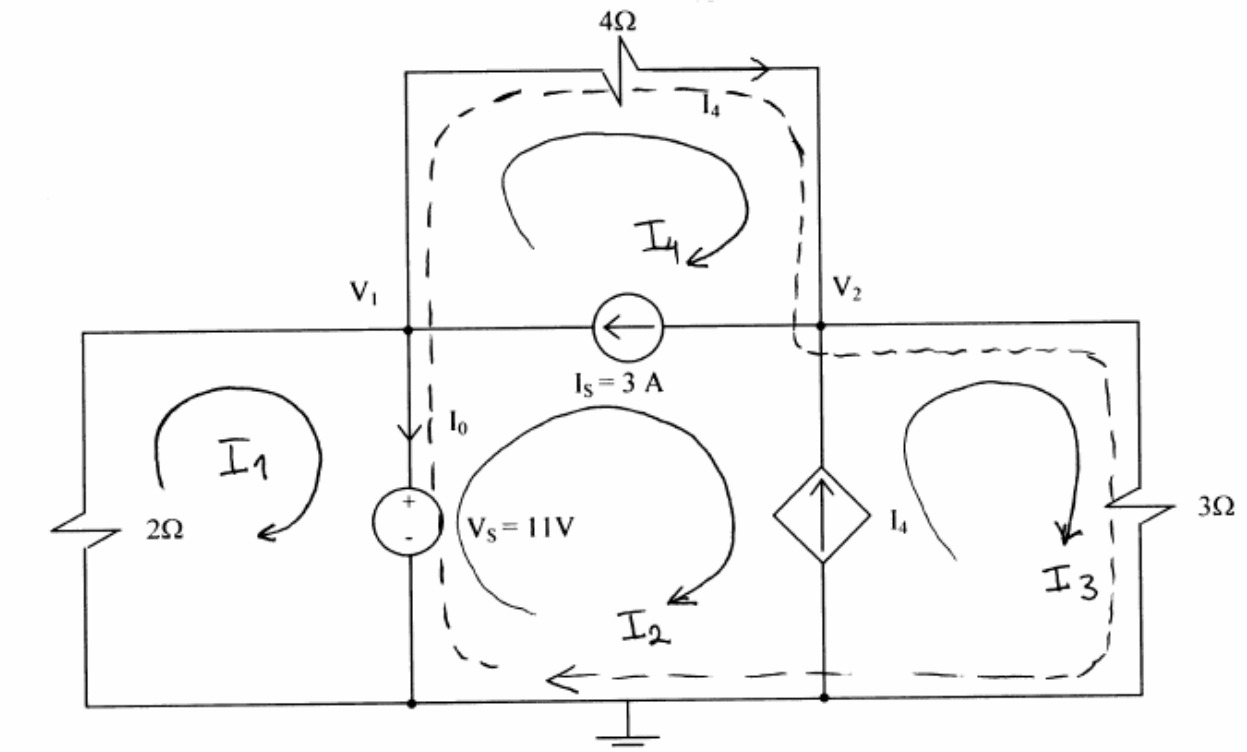
Find the equivalent resistance R_{AB}.



Find the power absorbed or supplied by each element.



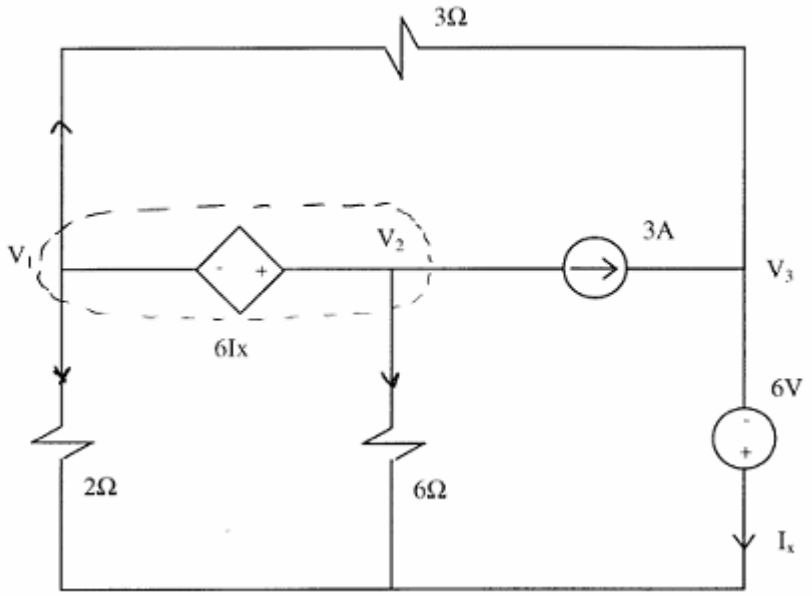
Use mesh analysis to **find the current I_0** in the circuit below.



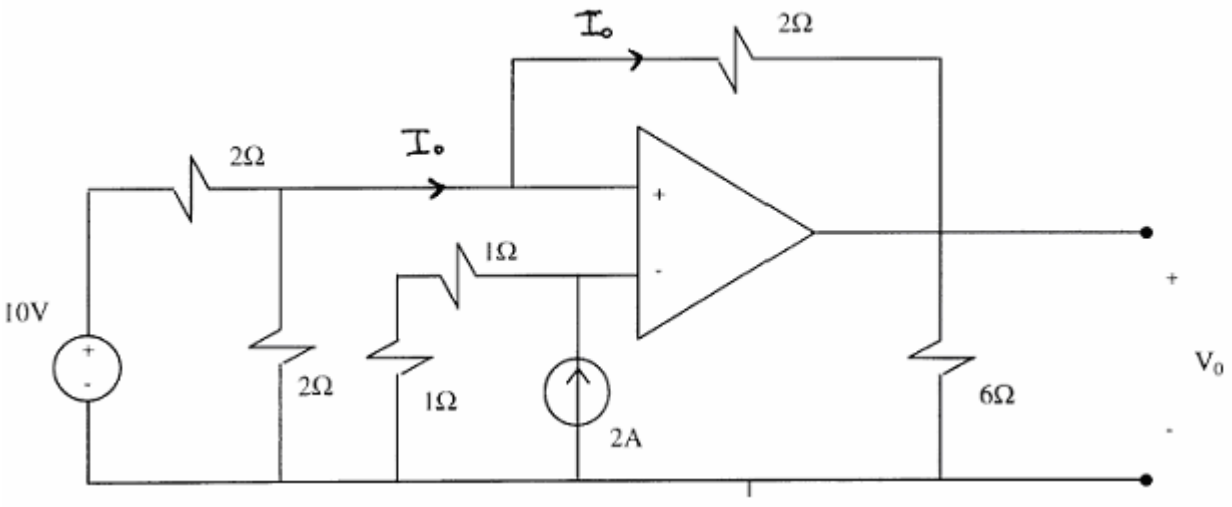
Write nodal analysis equations for V_1, V_2 and V_3 in standard form:

$$\begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{22} \\ a_{31} & a_{32} & a_{33} \end{bmatrix} \begin{bmatrix} V_1 \\ V_2 \\ V_3 \end{bmatrix} = \begin{bmatrix} b_1 \\ b_2 \\ b_3 \end{bmatrix}.$$

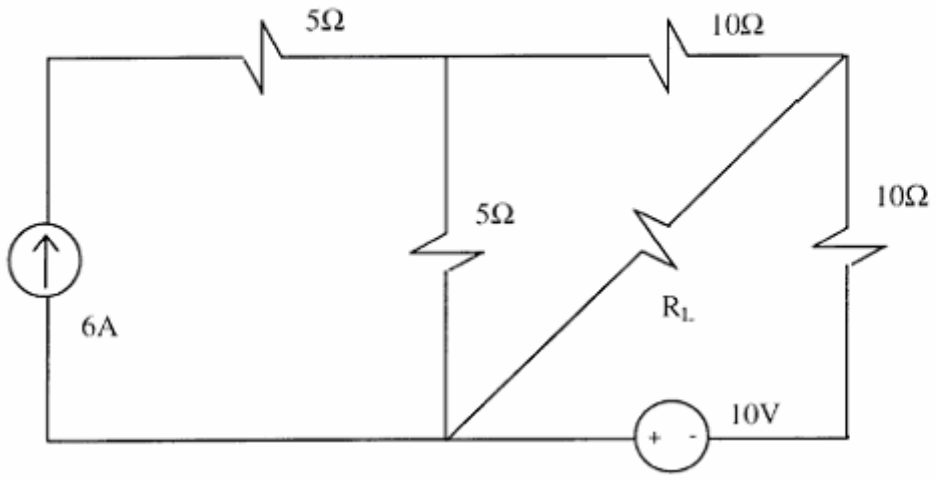
Do not solve the equations.



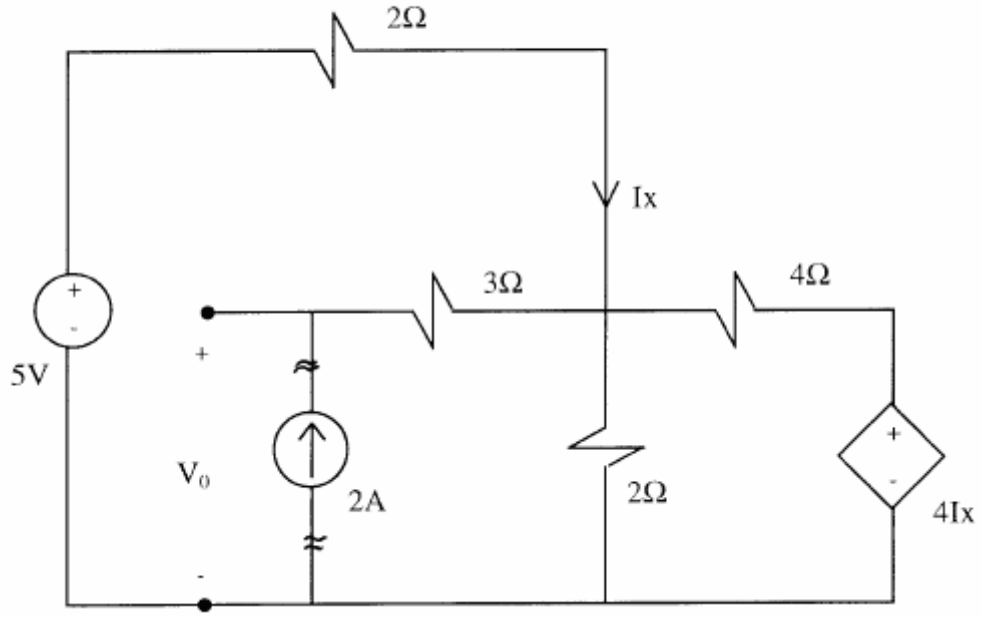
Use superposition to find V_0.



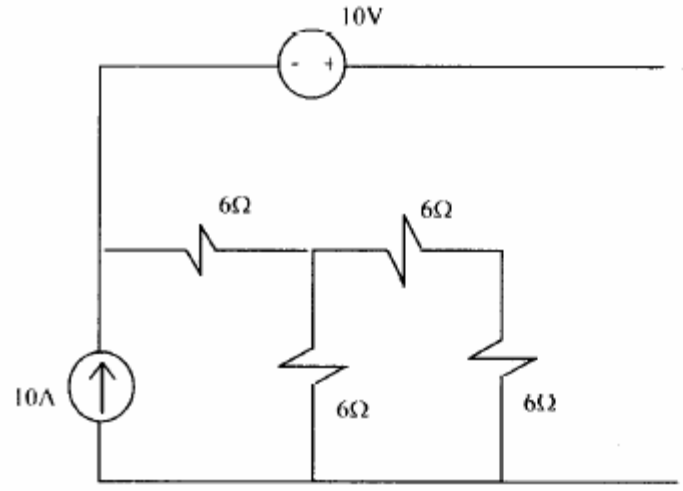
a) Use source transformation to find the value of R_L for maximum power transfer.
b) What is the maximum power that can be transferred to R_L?



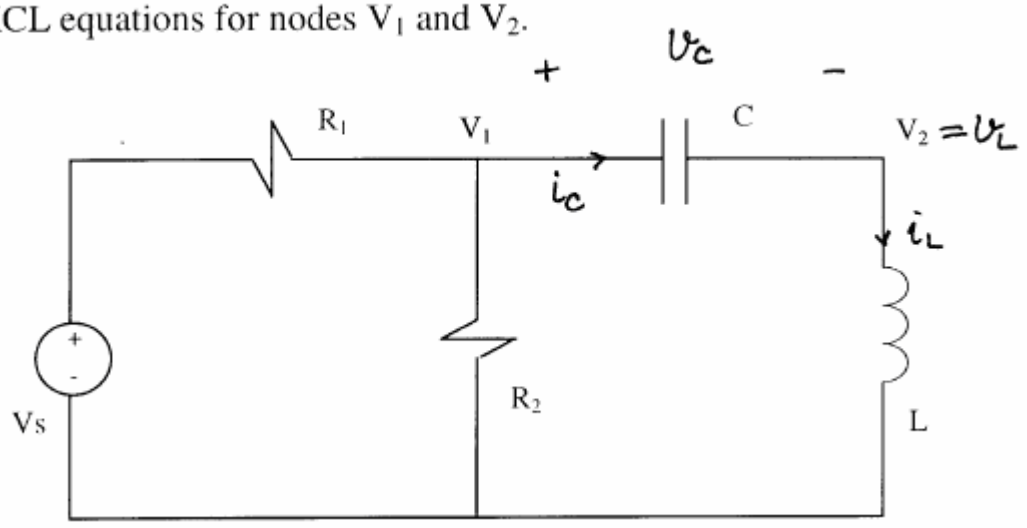
Use Thevenen's theorem to find V_0.



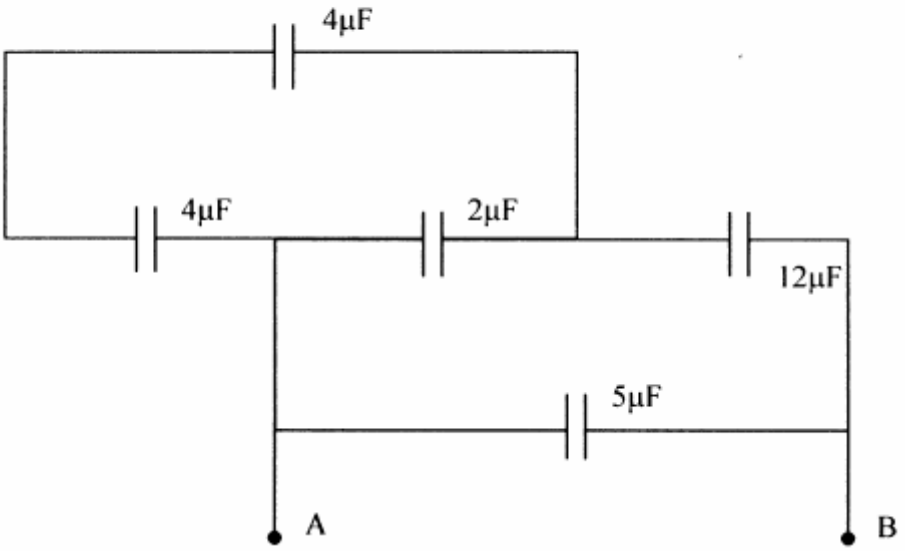
Find both Thevenen's and Norton's equivalent of the following circuit.



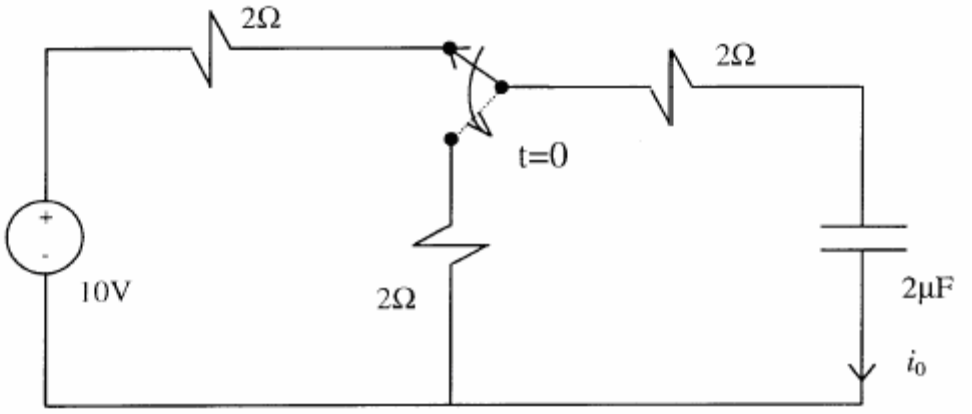
Write KCL equations for nodes V_1 and V_2.



Find the equivalent capacitance between points A and B.



Find $i_0(0^+)$.



Find voltage $V_x(t)$, for $t > 0s$. Sketch $V_x(t)$, for $t > -1s$.