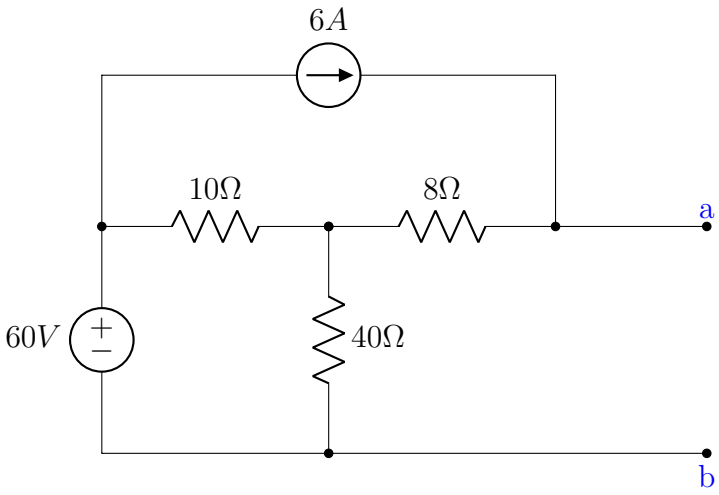
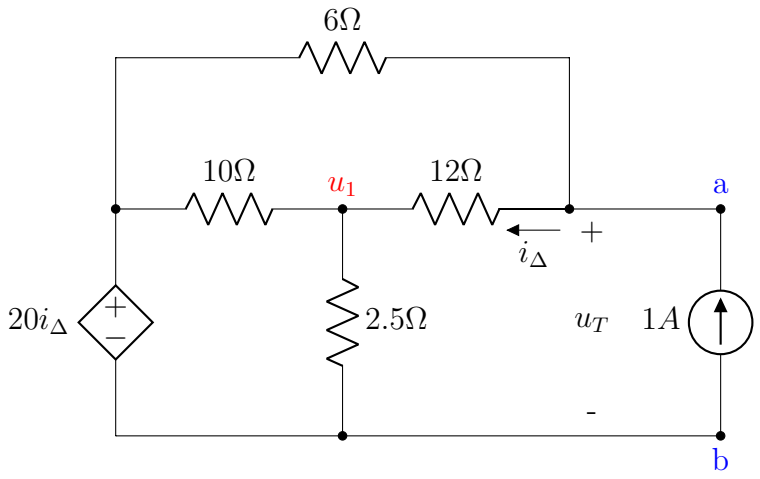
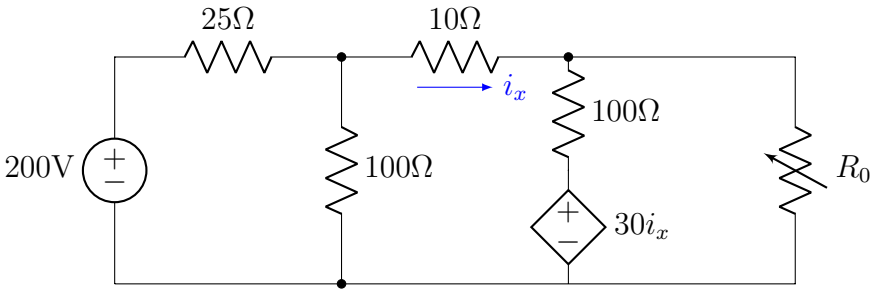
1. Find the Thévenin equivalent with respect to the terminals a and b for the circuit in Fig. P4.66.



2. Find the Thévenin equivalent with respect to theterminals a and b for the circuit seen in Fig. P4.77.

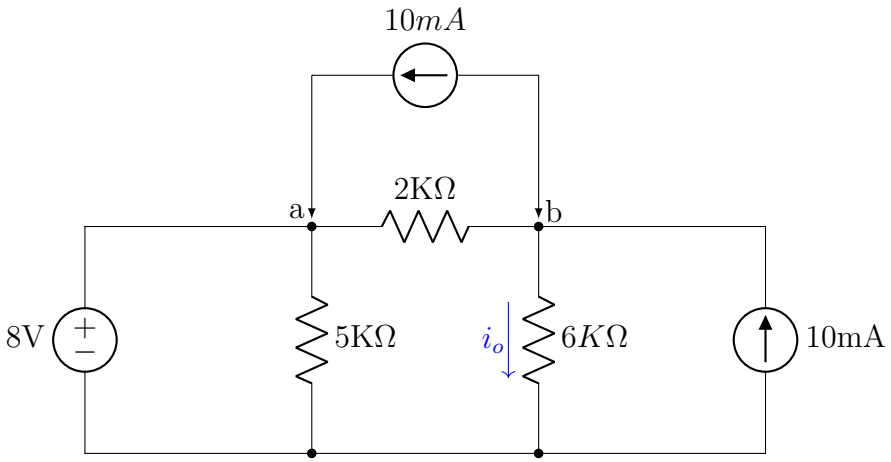


3. The variable resistor (R_0) in the circuit in Fig. P4.83 is adjusted until the power dissipated in the resistor is 250 W. Find the values of R_0 that satisfy this condition.



4. a) In the circuit in Fig. P4.95, before the 10 mA current source is attached to the terminals a,b, the current i_0 is calculated and found to be 3.5 mA. Use superposition to find the value of i_0 after the current source is attached.

b) Verify your solution by finding i_0 when all three sources are acting simultaneously.



5. Laboratory measurements on a dc voltage source yield a terminal voltage of 75 V with no load connected to the source and 60 V when loaded with a 20Ω resistor.

a) What is the Thévenin equivalent with respect to the terminals of the dc voltage source?

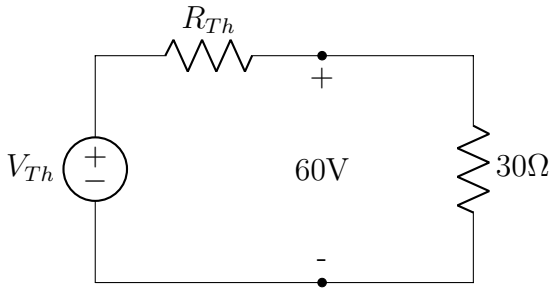
b) Show that the Thévenin resistance of the source is given by the expression

$$R_{Th} = (\frac{v_{Th}}{v_0} - 1)R_L,$$

where

$v_{Th} = the Thevenin voltage,$

$v_0 = the terminal voltage corresponding to the load resistance R_L$

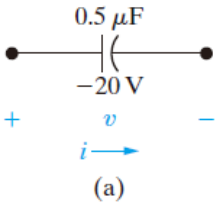


6. The initial voltage on the $0.5\mu F$ capacitor shown in Fig. P6.19(a) is -20V. The capacitor current has the waveform shown in Fig. P6.19(b).

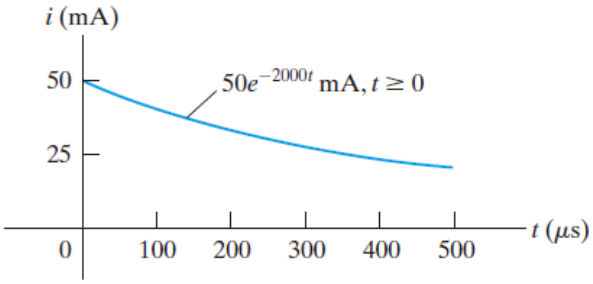
a) How much energy, in microjoules, is stored in the capacitor at t = $500\mu F$

b) Repeat (a) for t = ∞.

Figure P6.19



(a)



(b)

7. The two series-connected capacitors in Fig. P6.31 are connected to the terminals of a black box at t = 0 The resulting current i(t) for t > 0 is known to be $800e^{-25t}\mu A$.

a) Replace the original capacitors with an equivalent capacitor and find $v_0(t)$ for t ≥ 0.

b) Find $v_1(t)$ for t ≥ 0.

c) Find $v_2(t)$ for t ≥ 0.

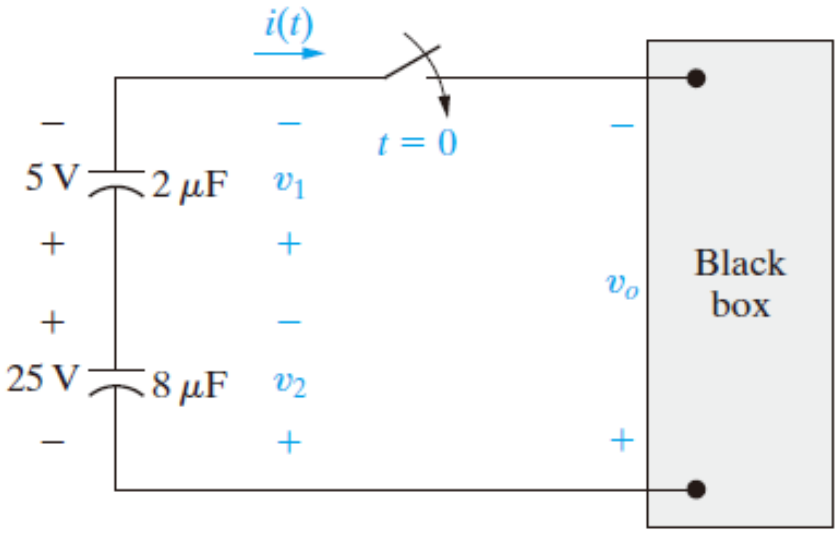
d) How much energy is delivered to the black box in the time interval 0 ≤ t < ∞.

e) How much energy was initially stored in the series capacitors?

f) How much energyis trapped inthe ideal capacitors?

g) Show that the solutions for v_1 and v_2 agree with the answer obtained in (f).

Figure P6.31



Ans7:

8. The current in the circuit in Fig. P6.35 is known to be $i_0 = 3e^{-5000t}(cos2000t + 6sin2000t)A$ for t$\leq 0^+$. Find $v_1(0^+)$ and $v_2(0^+)$.

Figure P6.35