

Submitted by.....

1. When a car has a dead battery, it can often be started by connecting the battery from another car across its terminals. The positive terminals are connected together as are the negative terminals. The connection is illustrated in Fig. 1.1. Assume the current i in Fig. 1.1 is measured and found to be 30 A.

- Which car has the dead battery?
- If this connection is maintained for 1 min, how much energy is transferred to the dead battery?

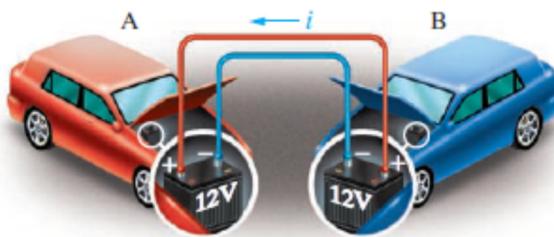


Fig. 1.1

2. The voltage and current at the terminals of the circuit element in Fig 1.2 are zero for $t < 0$. For $t \geq 0$, they are

$$\begin{aligned} i &= 15te^{-500t} \text{ A}, & t \geq 0. \\ v &= 80,000te^{-500t} \text{ V}, & t \geq 0; \end{aligned}$$

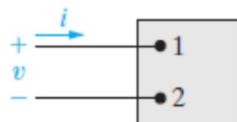


Fig. 1.2

- Find the time when the power delivered to the circuit element is maximum.
- Find the maximum value of power.

3. Determine the power absorbed by each of the elements in Fig. 1.3

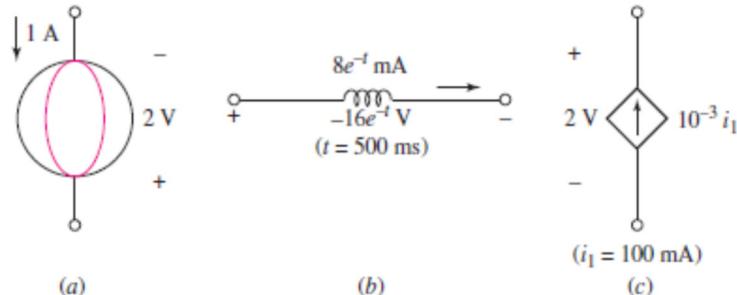


Fig. 1.3

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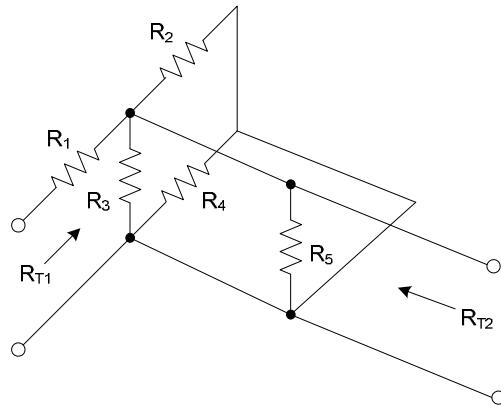
4. Find the resistor R_{T1} and R_{T2} in Fig 4 in term of resistors.

Fig. 1.4

5. The charge that enters the BOX is shown in Fig. 1.5. Calculate and sketch the current flowing into the BOX between 0 and 10 milliseconds.

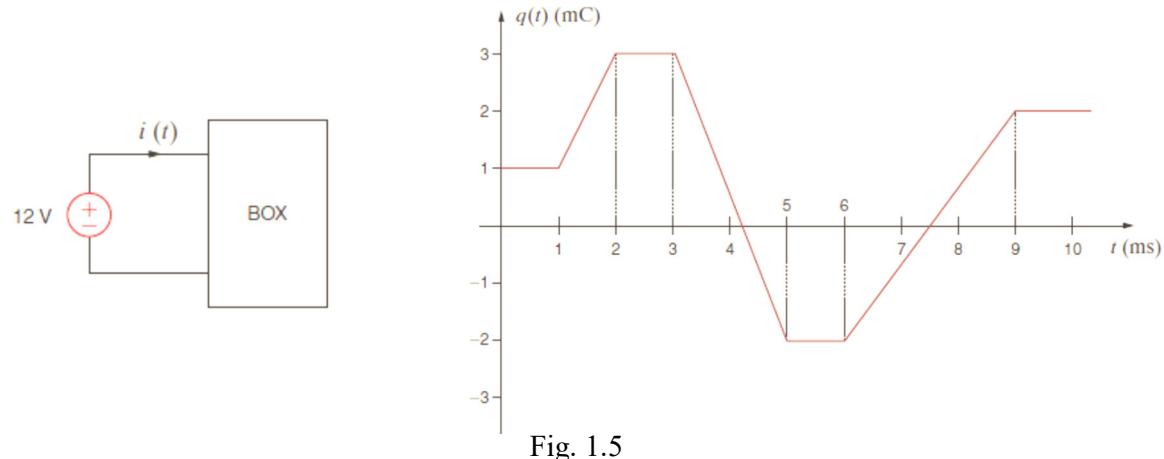


Fig. 1.5

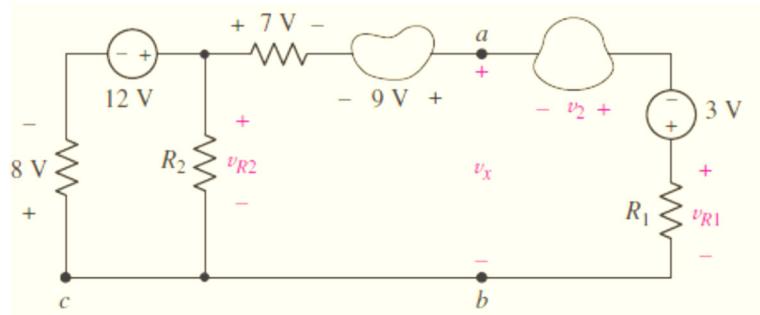
6. Find the v_{R2} and v_2 if $v_{RI} = 1\text{V}$.

Fig. 1.6

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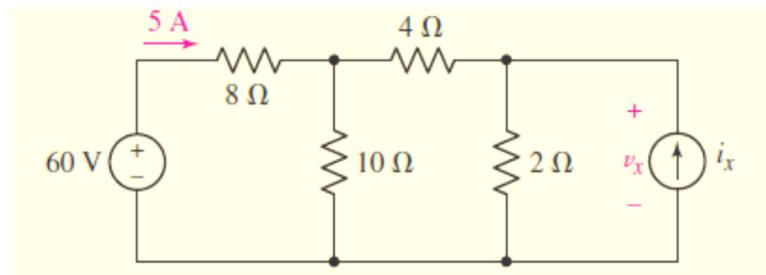
7. Determine v_x for the circuit in Fig. 1.7.

Fig. 1.7

8. The numerical values of the voltages and currents in the interconnection seen in Fig. 1.8 are given in Table 8. Identify the load and source for each device and show the interconnection satisfy the power check (power conservation).

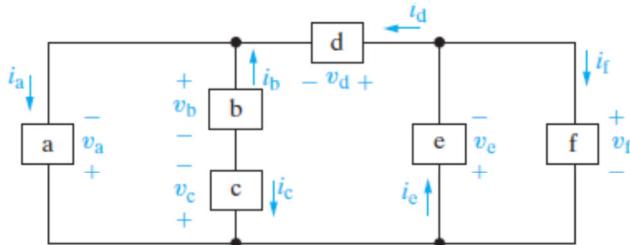


Fig. 1.8

Table 8

Element	Voltage (kV)	Current (μA)
a	-3	-250
b	4	-400
c	1	400
d	1	150
e	-4	200
f	4	50

9. For the circuit shown in Fig 1.9 find

- (a) The current i_l in microamperes.
- (b) The voltage v in volt.
- (c) The total power generated.
- (d) The total power absorbed.

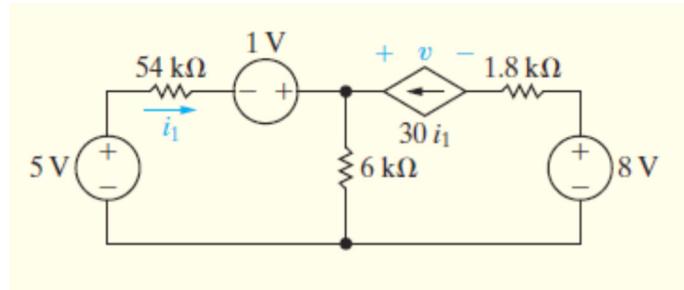


Fig 1.9

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1.10 The currents i_a and i_b in the circuit in Fig. 1.10 are 4 A and - 2A respectively.

- Find i_g .
- Find the power dissipated in each resistor.
- Find v_g .
- Show that the power delivered by the current source is equal to the power absorbed by all the other elements.

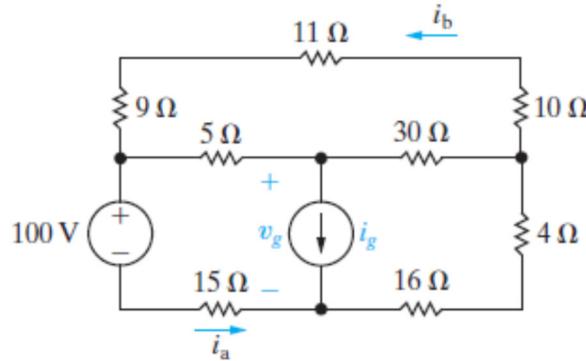


Fig. 1.10