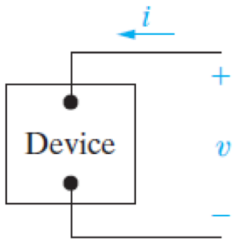
Question 1 [10]
The terminal voltage and terminal current were measured (b) on the device (a) shown. Construct a circuit model for the device consisting of a single resistor. Provide a graph (either hand-drawn or software generated) showing how you determine the value of the resistor.

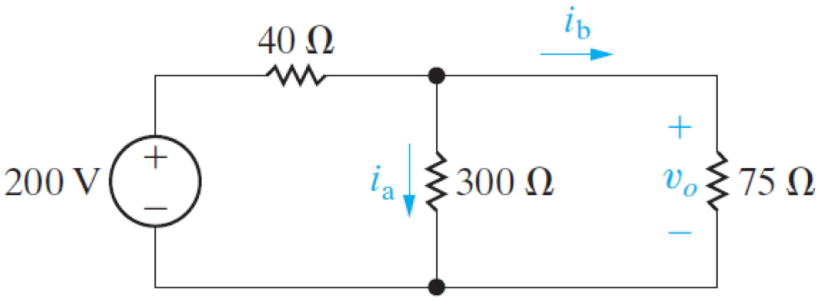


(a)

i (mA)	v (V)
−10	−120
−5	−60
5	60
10	120
15	180

(b)

Question 2 [10]



For the circuit shown, find:

(a) The value of i_a.

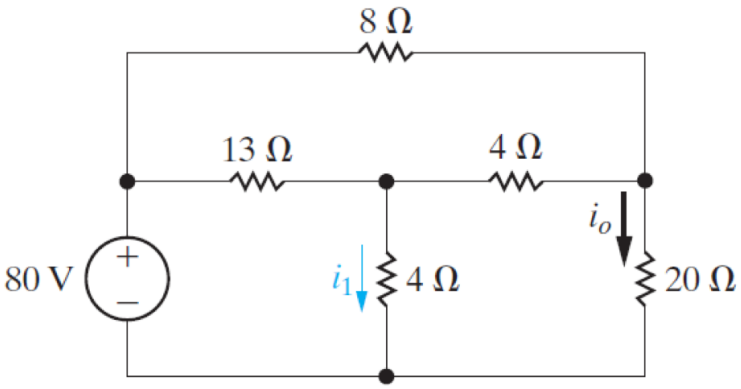
(b) The value of i_b.

(c) The value of v_a.

(d) the power dissipated in each resistor.

(e) the power delivered by the $200V$ source.

Question 3 [10]
In the circuit below, the current $i_o = 2A$.

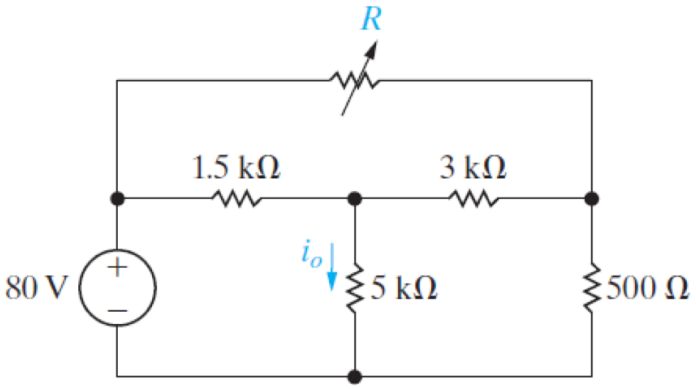


(a) Find i_1.

(b) Find the power dissipated in each resistor.

(c) Verify that the total power dissipated in the circuit equals the power provided by the voltage source.

Question 4 [10]
The variable resistor R is adjusted until $i_o = 10$ mA. Find the value of R.



Question 5 [10]
Find v_o and the total power supplied in the circuit.