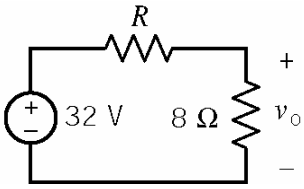
ES 250 First Midterm Practice Exam 1

1.



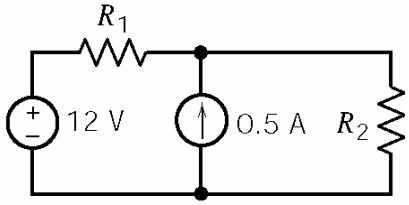
a. To cause v_o = 17.07 V choose R = ____7_____Ω.

b. To cause v_o = 9.143 V choose R = ____20_____Ω.

c. If R = 14 Ω then v_o =____11.6____ V

d. If v_o = 14.22 V the voltage source supplies ___56.9____W of power.

2.



The voltage source supplies 4.8 W of power and the current source supplies 3.6 W of power.

R_1 = ____12_____Ω and R_2 = ____8_____Ω

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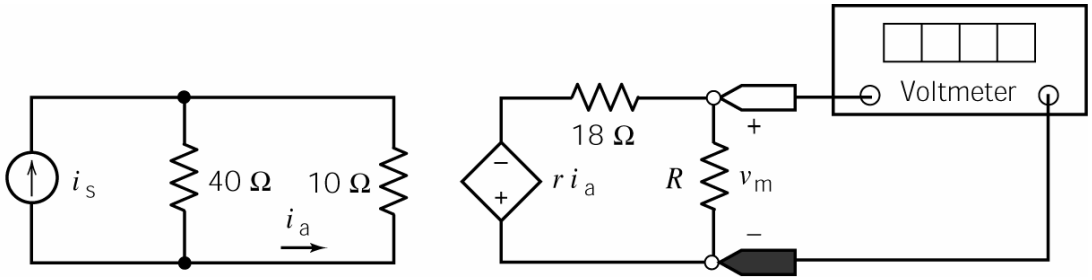
3. The input this circuit is the current of the current source, i_s. The output is the voltage measured by the meter, v_m. The output is proportional to the input, that is $v_m = k\, i_s$, where k is the constant of proportionality.



a. When i_s = 3 A, R = 12 Ω and r = 10 V/A, then i_a = ____2.4___ A and v_m = ____9.6___ V.

b. When R = 12 Ω, then r = __6.25___ V/A is required to cause $v_m = 2\, i_s$.

c. When r = 10 V/A then R = ____6____ Ω is required to cause $v_m = 2\, i_s$.

d. When R = 12 Ω and i_s = 5 A, then r = ___7.5___ V/A is required to cause v_m = 12 V.

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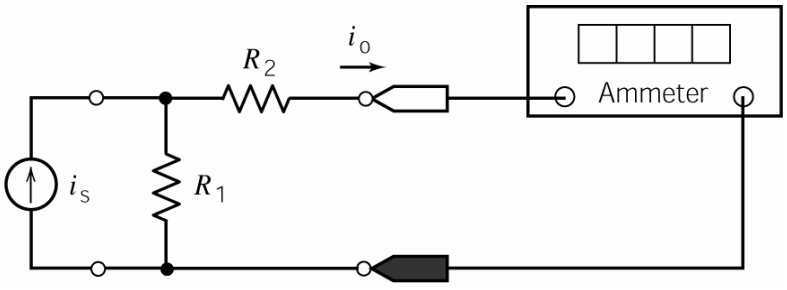
4. The input to this circuit is the source current, i_s. The output is the current measured by the meter, i_o. A current divider connects the source to the meter.



Given these observations:

A. The input $i_s = 5$ A causes the output to be $i_o = 2$ A.

B. When $i_s = 2$ A the source supplies 48 W.

The values of the resistances are $R_1 =$ ___20___ Ω and $R_2 =$ ____30___ Ω.

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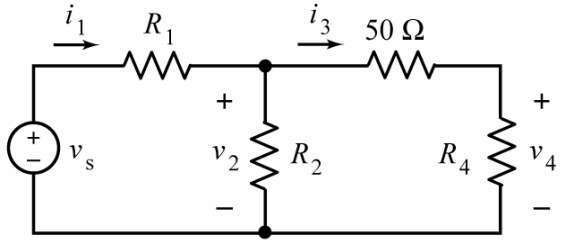
5. In this circuit $v_2 = \frac{2}{3} v_s$, and $i_3 = \frac{1}{5} i_1$ and $v_4 = \frac{3}{8} v_2$. Determine the values of R_1, R_2 and R_4.



R_1 = ____8____ Ω, R_2 = ____20____ Ω

and

R_4 = ____30____ Ω

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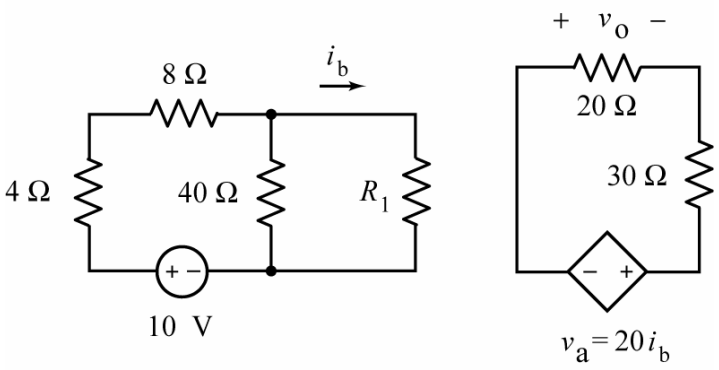
6. Given that

$v_a = 8$ V,

Determine the values of R_1 and v_o:

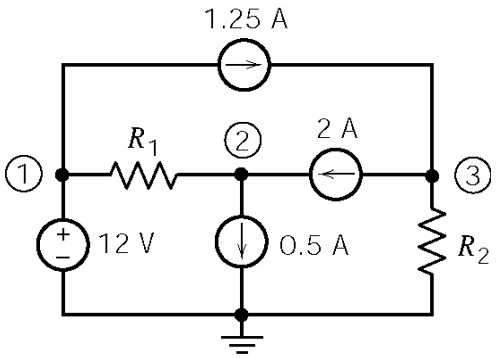


$R_1 =$ ____10____ Ω,

and

$v_o =$ ___–3.2___ V

7.



The encircled numbers are node numbers. The corresponding node voltages are

$v_1 = 12$ V, $v_2 = 21$ V and $v_3 = -3$ V,

a. The 0.5 A current source **supplies** ____–10.5___ W of power.

b. The 2 A current source **supplies** _____48____ W of power.

c. $R_1 =$ _____6____Ω and $R_2 =$ ____4_____Ω

d. The voltage source **supplies** ____–3_____ W of power.