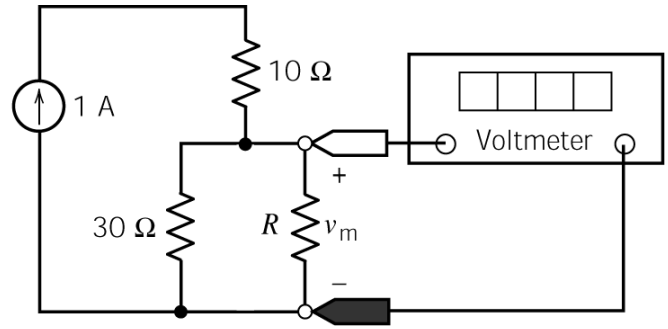# ES 250 First Midterm Bonus Practice Problems

1. The voltage measured by the voltmeter is

$$v_m = 20 \text{ V}$$

The value of the resistance R is _____ Ω.
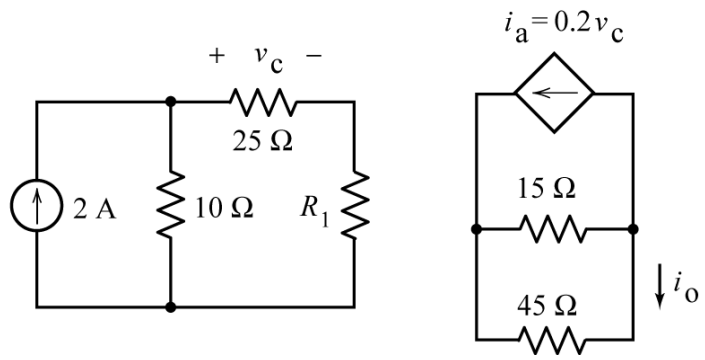
The current source is supplies _____ W of power.

2. Given that

$$i_a = 2 \text{ A},$$

Determine the values of R_1 and v_o:

$$R_1 = \underline{\hspace{1.5cm}} \ \Omega,$$

and

$$i_o = \underline{\hspace{1.5cm}} \text{ A}$$
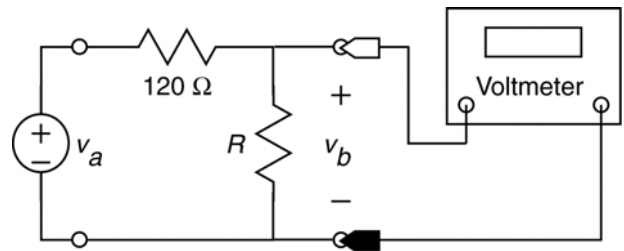
3. The input to this circuit is the voltage of the voltage source, v_a. The output of this circuit is the voltage measured by the voltmeter, v_b. This circuit produces an output that is proportional to the input, that is

$$v_b = k \, v_a$$

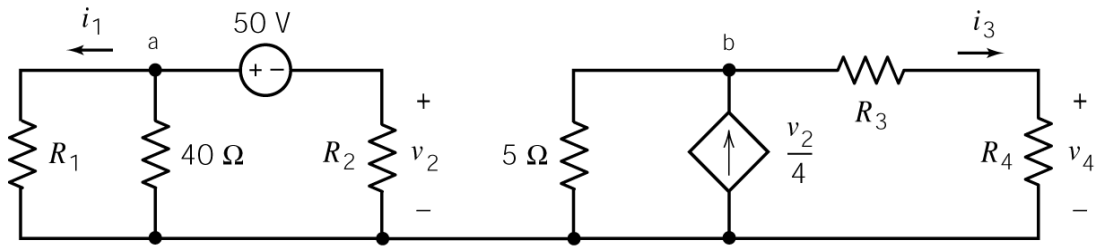where k is the constant of proportionality.

a.) When $R = 240 \ \Omega$ and $v_a = 18$ V, the output is $v_b =$ _____ V.

b.) When $R = 240 \ \Omega$ and $v_a = 18$ V, the power supplied by the voltage source is _____ W.

c.) When $R =$ _____ Ω and $v_a = 18$ V, the output is $v_b = 2$ V.

d.) When $R =$ _____ Ω, the output is $v_b = 0.2 \, v_a$. (That is, the constant of proportionality is $k = 0.2$.)

4.

Given that

$$i_1 = 0.625 \text{ A}, \quad v_2 = -25 \text{ V}, \quad i_3 = -1.25 \text{ A} \quad \text{and} \quad v_4 = -18.75 \text{ V}$$

Determine the values of R_1, R_2, R_3 and R_4:

$R_1 = $ _____ Ω, $R_2 = $ _____ Ω, $R_3 = $ _____ Ω and $R_4 = $ _____ Ω.

5. The 12 V source supplies 720 mW and the 18 V source supplies 4.32 W. Determine the values of the resistances R_1 and R_2.

$R_1 = $ _____ Ω and $R_2 = $ _____