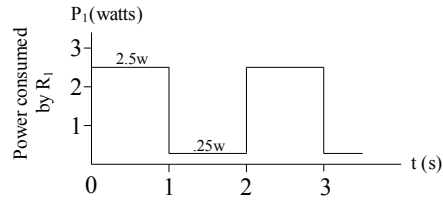
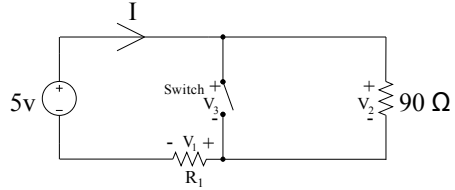


**Problem 1 (25 points)**



Answer questions below using the circuit and graph above:

(a) (4 pts.) What is the period for the graph above?

 Seconds

(b) (7 pts.) In the time between 0 to 1 seconds, is the switch closed or open? You must give detailed explanation for your answer to get credit.

Mark One  Switch open  
 Switch closed

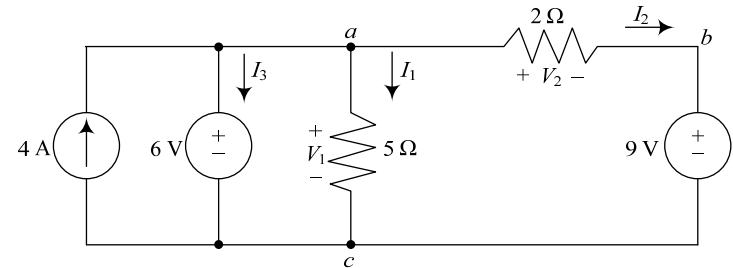
(c) (7 pts.) What is the RMS power consumed by  $R_1$ ? Show work.  
 Note that RMS power is not the average power.

 Watts (RMS)

(d) (7 pts.) What is the value of  $R_1$ ? Show work and justify your answer.

 Ohms

**Problem 1 (20 points)** Consider the circuit below.



(a) [2 pts.] Write a KCL equation for node  $a$ .

(b) [2 pts.] Write a KVL equation that relates  $V_1$  and  $V_2$ .

(c) [4 pts.] Use Ohm's Law to write equations that relate the currents  $I_1$  and  $I_2$  to the voltages  $V_1$  and  $V_2$ .

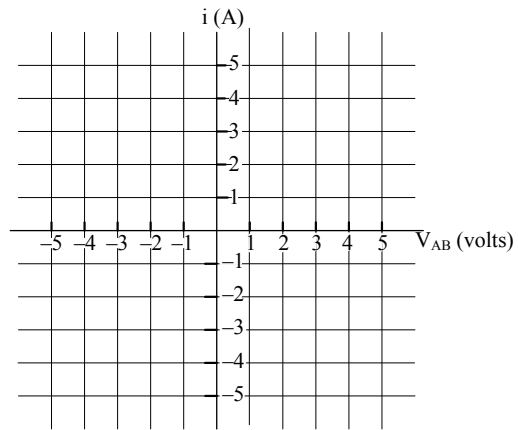
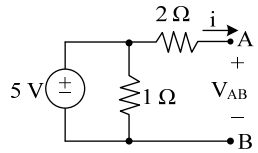
(d) [8 pts.] Determine the voltage  $V_2$  and the currents  $I_1$  and  $I_2$  and  $I_3$ .

$V_2 =$    $I_1 =$    
 $I_2 =$    $I_3 =$

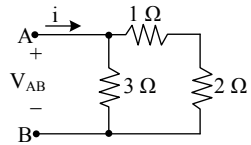
(e) [4 pts.] Is the 4 A current source a load or source of power? **Explain your reasoning.**

**Problem 5** (20 points)

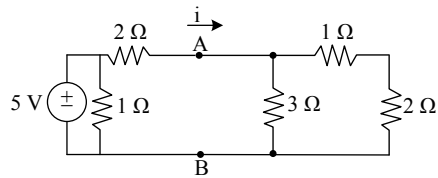
(a) Draw the IV graph for this circuit. Show work.



(b) Draw the IV graph for this circuit on the same graph above. Show work.



(c) What are the values for  $i$  and  $v_{AB}$  in this combined circuit? Explain how you found these values.



$i =$  \_\_\_\_\_

$v_{AB} =$  \_\_\_\_\_