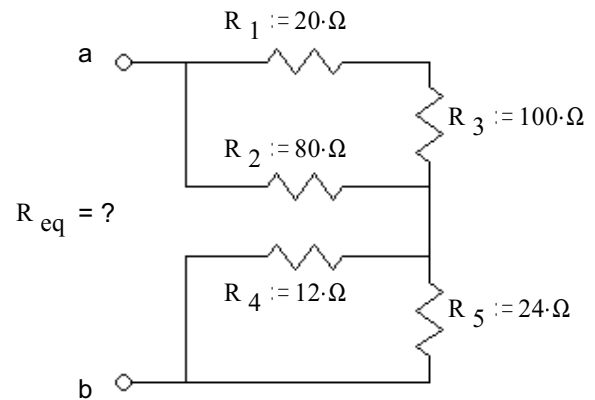


# ECE1050/60 Exam 1 given: Spring 04 (The space between problems has been removed.)

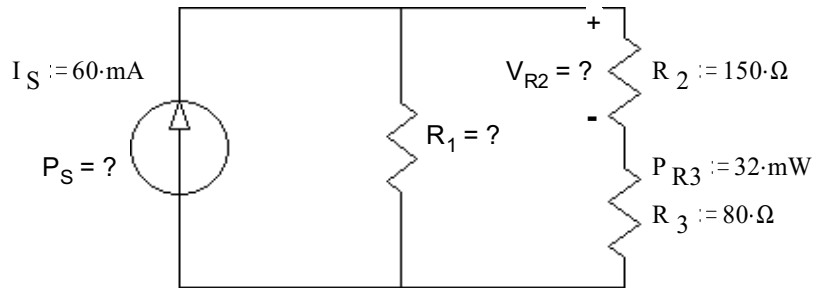
Remember, to get the most possible partial credit, always show all the intermediate values that you can calculate. If further calculations depend on a value that you can't figure out, just use a letter (like  $I_{R1}$ ) or a guessed value and proceed.

1. (10 pts) Find the equivalent resistance of this network,  
i.e. what would an ohmmeter read if hooked to the terminals a and b.

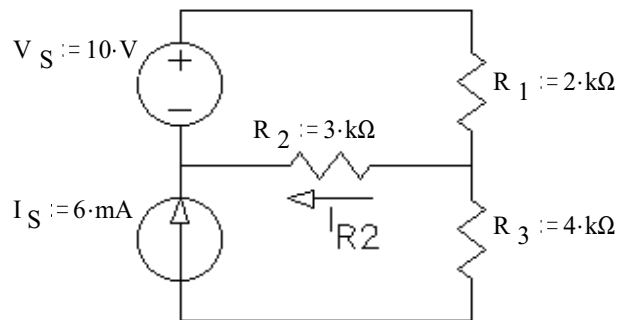


2. (5 pts) A 10V source is hooked to the terminals a and b. Use the voltage divider concept to find the voltage across resistor  $R_4$ .

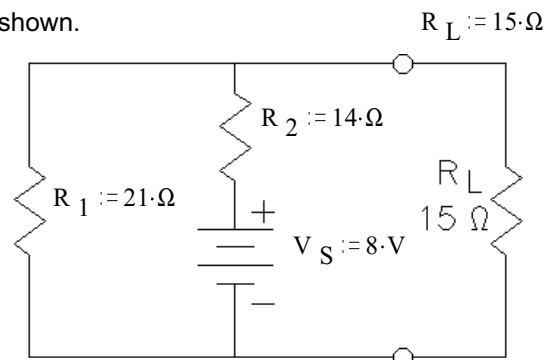
3. (20 pts) In the circuit shown find the power input by the source ( $P_S$ ), the resistor value;  $R_1$ , and the voltage across  $R_2$  ( $V_{R2}$ ).



4. (15 pts) a) Use the method of superposition to find the current through  $R_2$ . Be sure to clearly show and **circle** your intermediate results.



5. a) (18 pts) Find and draw the Thévenin equivalent of the circuit shown. The load resistor is  $R_L$ .

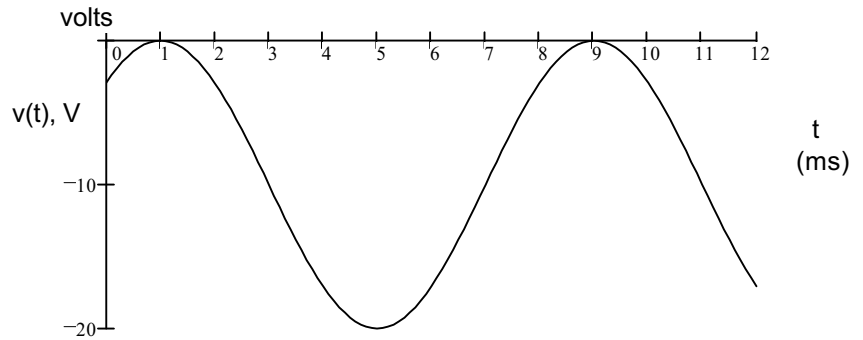


- b) Find and draw the Norton equivalent of the same circuit.  
c) Find the load current using your Thévenin equivalent circuit.

**ECE 1050/60 Exam 1 Spring 04 p2**

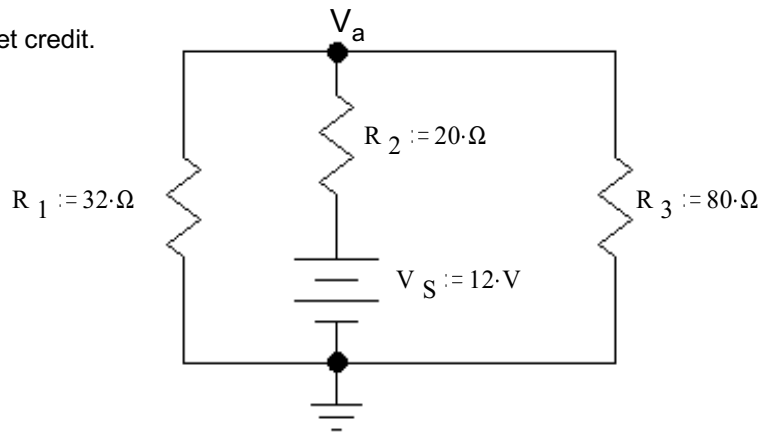
6. (17 pts) For the waveform shown, find:

- a) peak-to-peak voltage or current,  $V_{pp}$
- b) amplitude, A
- c) period, T
- d) frequency  $f$  in cycles/sec or Hz
- e) frequency  $f$  in radians/sec
- f) the phase angle in degrees
- g) a complete expression for  $v(t)$ , include numbers and units



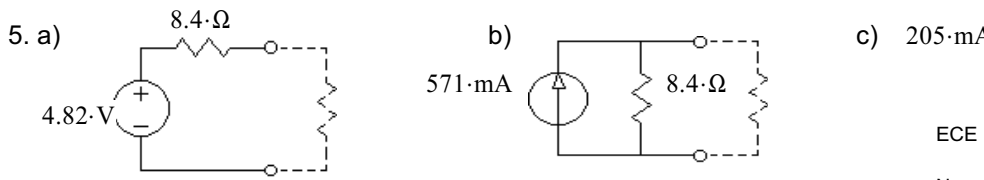
7. (15 pts) Use nodal analysis to find  $V_a$ .

You **MUST** show nodal analysis work to get credit.



**Answers**

1.  $56 \cdot \Omega$       2.  $1.43 \cdot V$       3.  $V_{R2} := 3 \cdot V$      $P_S := 0.276 \cdot W$      $R_1 := 115 \cdot \Omega$       4.  $2 \cdot mA - 2.4 \cdot mA = -0.4 \cdot mA$



6. a)  $20 \cdot V$     b)  $10 \cdot V$     c)  $8 \cdot ms$     d)  $125 \cdot Hz$     e)  $785 \cdot \frac{rad}{sec}$   
 f)  $-45 \cdot deg$     g)  $10 \cdot V \cdot \cos\left(785 \cdot \frac{rad}{sec} \cdot t - 45 \cdot deg\right) - 10 \cdot V$

7.  $6.4 \cdot V$

ECE 1050 / 60 Midterm #1 Arn Stolp

Name \_\_\_\_\_  
 Scores:  
 Pages 1&2 \_\_\_\_\_ of a possible 35 pts  
 Pages 3&4 \_\_\_\_\_ of a possible 33 pts  
 Pages 5&6 \_\_\_\_\_ of a possible 32 pts  
 Total \_\_\_\_\_ of a possible 100 pts