AE 252 Q-5b In ***Pencil*** please or deduct ____ points
NAME:_____DATE_____

1. Express OHM's LAW in terms of Current, Volts and Resistance.

I = E = R =

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2. Express the Power Formula three ways — current and resistance, volts and resistance, volts and current

P = P = P =

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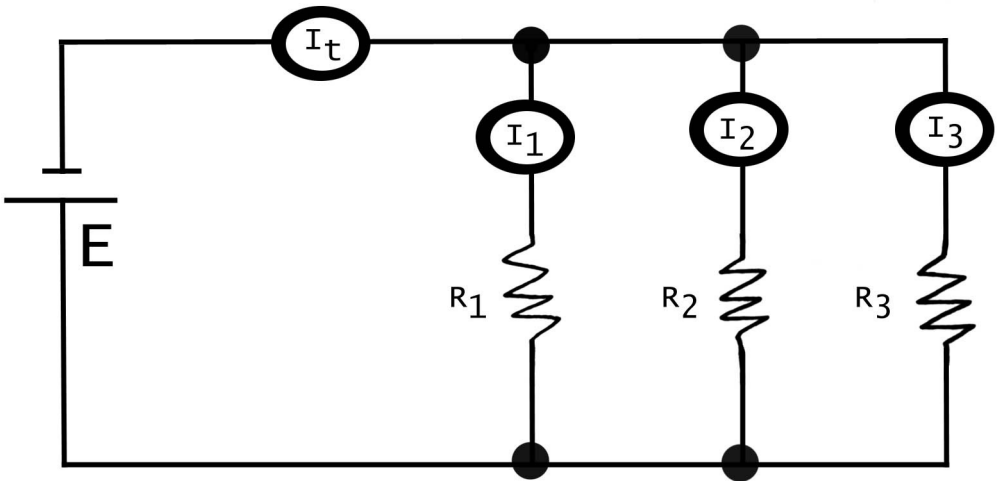
3. In the image below, **E** = 20v, **R1** = 10-ohms, **R2** = 20-ohms, **R3** = 40-ohms

Calculate the following:

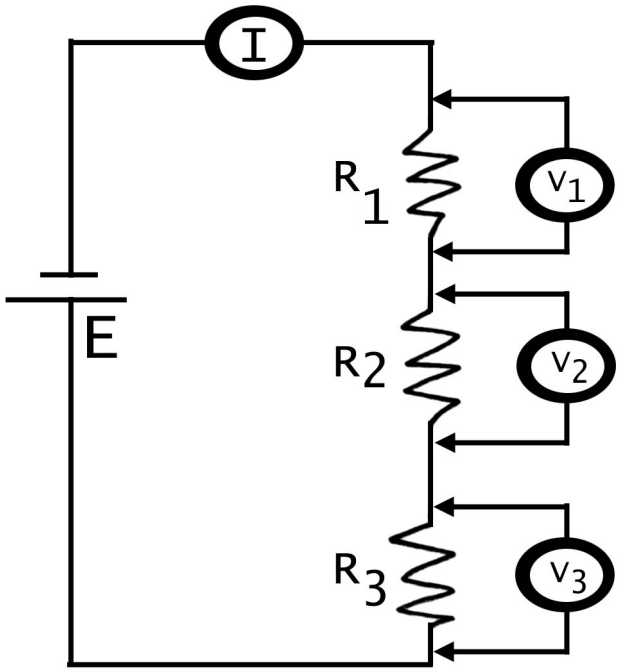
- Equivalent Resistance_____
- Total Current_____
- The three branch currents_____
- Power dissipated by each resistor_____
- Add branch current and compare with total current_____
- Show work on this or reverse side!



circuit-1

4. Same E- and R-values as the previous problem. Calculate the following:

- Total Resistance_____
- Total Current_____
- V-1_____V-2_____V-3_____
- Power dissipated by each resistor: R-1_____R-2_____R-3_____



circuit-2

5. What aspect of soldering technique is critical in order to make a good connection?

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_____

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6. What tip temperature range is appropriate when soldering conventional components to a printed circuit board (PCB)?

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7. The audio reference of 0dB(+ suffix) is the result of 0.775 volts being inflicted upon a tired, poor and weary 600-Ω destination (load) Impedance. This odd voltage was chosen because the ***Power*** dissipated by the load is a nice round number.

formula	quantities	calculate	Answer (watts)	Answer (???)

8. What do the suffixes "u," "m" and "V" stand for in the examples below and which one relates to the answer in question 7?

- 0 dBu = _____volts into _____ load impedance. (7?____)
- 0 dBm = _____ volts into _____ load impedance. (7?____)
- 0 dBV = _____ volts into _____ load impedance. (7?____)

<u>For the problems below, use the Log Table when applicable.</u>

$$dB = 20 * \log \frac{new\ volts}{ref\ volts}$$

$$dB = 10 * \log \frac{new\ power}{ref\ power}$$

$$RMS = .5 P\text{-}P * .707$$

9. All multi-meters can measure RMS AC volts, but few are calibrated for audio *and* decibels. If a multi-meter is all that's available to calibrate the VU meters on an analog console and the console's nominal level is +4dBu (or dBm), what voltage needs to be at the Mix and Buss outputs before the VU meters can be calibrated?

a.) plug in quantities	c.) intermediate answer	e.) ratio
b.) calculate	d.) anti-log	f.) answer

10. An analog console typically has 18dB of headroom above the Nominal Level. How many volts RMS and peak-to-peak is this?

a.) plug in quantities	d.) anti-log	g.) plug into RMS formula
b.) calculate	e.) ratio	h.) calculate
c.) intermediate answer	f.) RMS answer	i.) peak-to-peak answer

11. An intern is calibrating the input sensitivity of an analog tape machine from a console generating a 1KHz tone set to 0VU on the mix buss VU meters. The DIM switch is engaged, quieting the monitors by 18dB. The signal is just loud enough to confirm the tone (the monitors are dissipating one watt each). When someone accidentally bumps the DIM switch, the loudspeakers are now dissipating how many watts?

a.) plug in quantities	c.) Intermediate answer	e.) ratio
b.) calculate	d.) anti-log	f.) answer

12. Determine resistor values. Note **the difference** between *precision* and *standard* tolerance is in **the right-most band**). Below each color, write the respective significant digits, multiplier and tolerance as dictated by their positions.

1st band	2nd band	3rd band	4th band	5th band	VALUE @ %
Brown	Black	Orange	Gold		
Brown	Black	Black	red	Brown	
Orange	Orange	Red	Silver		
Orange	Orange	Black	Brown	Brown	
Yellow	Violet	Gold	Gold		
Red	Red	Green	None		
Blue	Gray	Black	Brown	Brown	