HOMEWORK #1

1. a) Solve the following simultaneous equations for v_1 and v_2:

$$3v_1 - 4v_2 = 14$$

$$\frac{4(v_1 - v_2)}{7} + \frac{v_1}{2} = 29$$

b) Solve the following simultaneous equations for R_1 and R_2:

$$\sqrt{R_1^2 + R_2} = 3$$

$$\frac{1}{\frac{1}{R_1} + \frac{1}{R_2}} = \frac{10}{7}$$

2. Complete the following table showing products of prefixes for engineering units:

·	n	μ	m		k	M
n		f				
μ	f			μ		
m		n				k
			m			
k				k	M	
M	m				G	

Note: a = 10^{-18}, f = 10^{-15}, p = 10^{-12}, n = 10^{-9}, μ = 10^{-6}, m = 10^{-3},
blank = 10^{0}, k = 10^{3}, M = 10^{6}, G = 10^{9}, T = 10^{12}

3. Compute the power as a function of time consumed by a battery-powered device that draws the following current from a 1.5 volt battery.

a) Compute the power as a function of time consumed by a battery-powered device that draws the following current from a 1.5 volt battery.

$$i(t) = 1\text{ mA} + 2\cos(2\pi t + 30°)\text{ mA}$$

b) Find the energy consumed by the device described in (a) in the first minute. Note: Convert the 30° to radians before integrating.

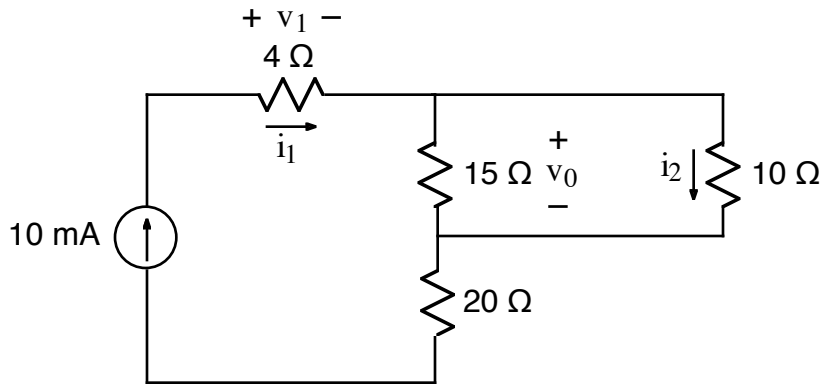
4. Perform the following calculations, and write the answers with appropriate prefixes (such as μ, m, k, etc.) for engineering units:

a) $v = 5.6\ \text{mA} \cdot 0.5\ \text{k}\Omega$

Note: $\text{V} = \text{A} \cdot \Omega$

b) $R = 1.2\ \text{k}\Omega + 700\ \Omega$

5.



Using the passive sign convention, complete the labeling of all currents and voltages for the resistors in the above circuit.