



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

$$3v_1 - 4v_2 = 14 \qquad \frac{4(v_1 - v_2)}{7} + \frac{v_1}{2} = 29$$

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

$$\sqrt{R_1^2 + R_2} = 3 \qquad \frac{1}{\frac{1}{R_1} + \frac{1}{R_2}} = \frac{10}{7}$$

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.

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

- b) Find the energy consumed by the device described in (a) in the first minute.

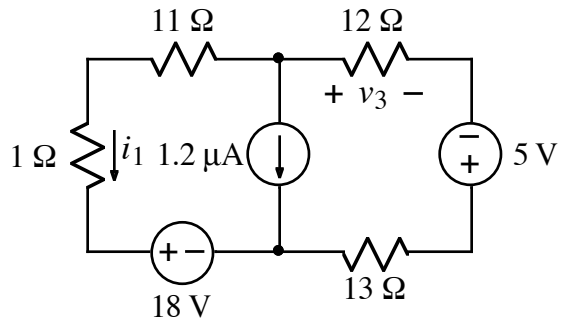
Note: Convert the 30° to radians before integrating.

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

a) $v = 5.6 \text{ mA} \cdot 0.5 \text{ k}\Omega$ Note: $V = A \cdot \Omega$

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.

ANS: 1.b) One solution is $R_1 = 2.265$, $R_2 = 3.866$ 2. same values on diags / 3. $w(t) = 90$ mJ
4.a) $v = 2.8$ V 5. Answer not unique, current arrows must point to minus signs.