



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: $a = 10^{-18}$, $f = 10^{-15}$, $p = 10^{-12}$, $n = 10^{-9}$, $\mu = 10^{-6}$, $m = 10^{-3}$,
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.

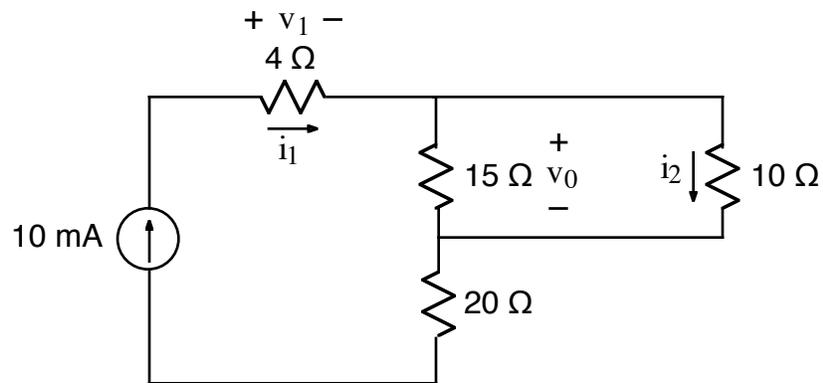
4. Perform the following calculations, and write the answers with appropriate prefixes (such as μ , m, k, etc.) for engineering units:

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.