1. Find and draw the Thevenin equivalent circuit of the circuit below. The load resistor is $R_L$.

![Thevenin equivalent circuit](image1)

2. a) Find and draw the Thévenin equivalent of the circuit shown.

![Thévenin equivalent circuit](image2)

b) Find the power dissipated in the load using your Thévenin equivalent circuit. $P_{RL} = ?$

3. For the circuit shown at right, use Thevenin's theorem to find the current through the 50 Ω resistor $R_4$.

![Current through 50 Ω resistor](image3)

4. For each of the following sinusoidal waves, find:
   1) Peak-to-peak voltage or current, $V_{pp}$ or $I_{pp}$
   2) Amplitude, $A$ (or $V_p$ or $I_p$)
   3) Period, $T$
   4) Frequency $f$ in cycles/sec or Hz
   5) An expression for $v(t)$ or $i(t)$ in terms of $A\cos(\omega t + \phi)$
   (The frequency $\omega$ is in radians/sec or degrees)

![Sinusoidal waves](image4)
5. For each of the following waveforms, find:
1) Peak-to-peak voltage or current, \( V_{\text{pp}} \) or \( I_{\text{pp}} \)
2) Average, (\( V_{\text{DC}}, I_{\text{DC}}, V_{\text{ave}}, \) or \( I_{\text{ave}} \))
3) Period, \( T \)
4) Frequency \( f \) in cycles/sec or Hz

6. For problem 5a above, write a full expression for \( v(t) \) in terms of \( v(t) = A\cos(\omega t + \phi) + V_{\text{DC}} \)

7. What is special about a "signal".

8. Could any of the waveforms shown in problems 4, 5, and 6 be considered a "signals"? Why?

**Answers**

1. a) 4.091-V , 28.4-kΩ  
   b) 6-V , 112-Ω

2. a) 16-V , 112-Ω

3. a) 0.2-V 0.1-V 12-ms 83.3-Hz 0.1-V-cos(523.6-t)
   b) 24-V 12-V 0.018-ms 55.6-kHz
   c) 16-mA 8-mA 0.3-ms 3333-Hz

   b) 480-mW  
   c) 1.88-mA

4. a) 12-V 3-V 6-ms 167-Hz
   b) 12-V 6-V 4-ms 250-Hz
   c) 250-mA 25-mA 0.6-ms 1.667-kHz

5. \( v(t) := 12-V \cdot \cos(349100t - 90\text{-deg}) + 3-V \)

6. \( v(t) := 6-V \cdot \cos(1047t - 90\text{-deg}) + 3-V \)

7. It carries information

8. No, you say why