• Office Hours: MW 3:30-5:00 p.m.
• Read Chapter 8.1-8.3 from the book and the lecture notes.

1. [24] Consider the sinusoidal voltage \( v(t) = 100 \cos(400\pi t + 60^\circ) \) V. Answer the following questions for this waveform:
   a) What is the maximum amplitude of the voltage?
   b) What is the frequency in Hertz?
   c) What is the frequency in radians per second?
   d) What is the phase angle in radians?
   e) What is the phase angle in degrees?
   f) What is the period in milliseconds?
   g) What is the first time after \( t=0 \) that the voltage equals to 100V?
   h) What is the minimum number of milliseconds that the function must be shifted to the right to obtain \( 100 \cos(400\pi t) \) V?

2. [10] Convert the following sinusoids into phasors:
   a) \( 100 \cos(500t + 30^\circ) \)
   b) \( 90 \sin(\omega t + 135^\circ) \)

3. [10] Convert the following phasors into sinusoids:
   a) \( \vec{V} = 10 \angle 30^\circ, \quad f = 100\text{Hz} \)
   b) \( \vec{I} = 5 - j2, \quad T = 100\text{ms} \)

4. [20] A 10\( \Omega \) resistor, a 8 mH inductor, and a 2.5 \( \mu \)F capacitor are connected in series. The series-connected elements are energized by a voltage source, \( 240 \cos(5000t - 40^\circ) \) V.
   a) Draw the phasor domain equivalent circuit.
   b) Find the equivalent impedance of the circuit in rectangular form.
   c) Find the phasor current.
   d) Find the steady-state expression for the current, \( I(t) \).
