(1) You are given the circuit of Figure 1 with the indicated source voltage and line current. The line current is known to be; \( I = 2.83\angle 60^\circ \) A. Determine the approximate value of the capacitor \( C \).

![Figure 1: Circuit for problem 1.](image)

(2) You are given the op-amp circuit of Figure 2. Determine the phasor output voltage \( V \) as shown in the circuit diagram. Express \( V \) in polar form.

![Figure 2: Circuit for problem 2.](image)
(3) You are given the AC circuit shown in Figure 3. Use mesh analysis to find the mesh currents $I_1$ and $I_2$ as indicated in the circuit diagram. Express $I_1$ and $I_2$ in polar form.

![Figure 3: Circuit for problem 3.](image)

(4) You are given the AC circuit shown in Figure 4.

(a) Use nodal analysis to find the node voltages $V_1$ and $V_2$ as indicated in the circuit diagram. Express $V_1$ and $V_2$ in polar form.

(b) Prepare a phasor diagram showing $V_1$ and $V_2$. Which voltage is leading? Explain.

![Figure 4: Circuit for problem 4.](image)

(5) The load for a certain AC circuit is shown in Figure 5.

(a) Find the impedance of this load, $Z$, as indicated in the diagram. Express $Z$ in polar form.

(b) Determine whether this is a leading or lagging load. Explain your answer.

![Figure 5: Circuit for problem 5.](image)