EK307 – Fall 2025 – Homework #9
Due: Tuesday 11/25/2025 by 11:59pm

1)

Convert the following sinusoids to phasors in polar and rectangular form

1a) $v(t) = 20\cos(150t - 60°)$ V

1b) $v(t) = 10\cos(1000t + 180°)$ V

1c) $i(t) = -4\cos(3t) + 3\cos(3t - 90°)$ A

2) Evaluate the following complex numbers and leave your results in polar form:

(a) $5\angle 30° \left(6 - j8 + \dfrac{3\angle 60°}{2 + j}\right)$

(b) $\dfrac{(10\angle 60°)(35\angle -50°)}{(2 + j6) - (5 + j)}$

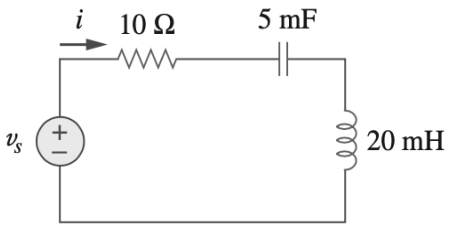
3) Using phasors, find:

(a) $3\cos(20t + 10°) - 5\cos(20t - 30°)$

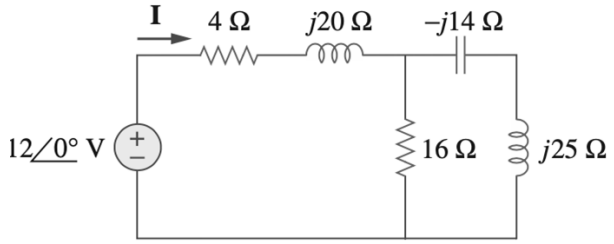
(b) $40\sin 50t + 30\cos(50t - 45°)$

(c) $20\sin 400t + 10\cos(400t + 60°) - 5\sin(400t - 20°)$

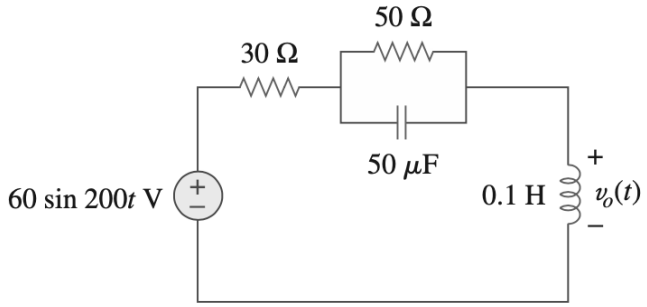
4) Find current i in the circuit below when $v_s(t) = 50\cos 200t$ V.



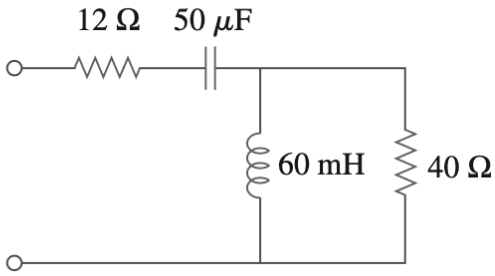
5) For the circuit shown below , find Z_{eq} and use that to find current **I**. Let $\omega = 10$ rad/s.



6 Calculate $v_o(t)$ in the circuit shown below



7) At $\omega = 377$ rad/s, find the input impedance of the circuit shown below



8) Determine $\mathbf{Z}_T$ and **I** for the circuit below