

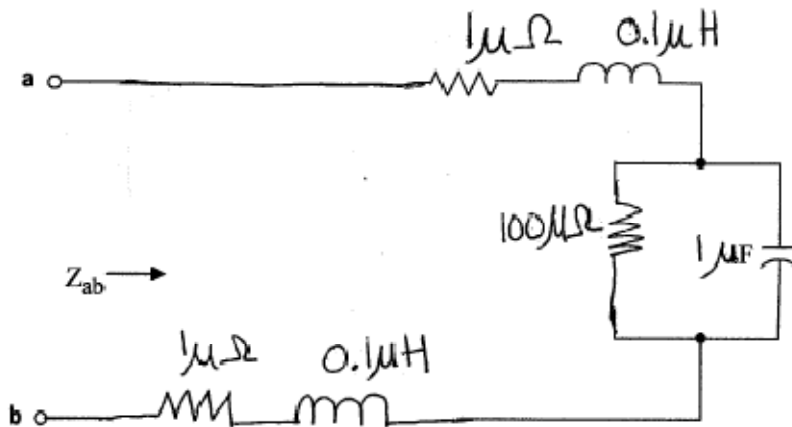
1. Plot each of the following complex numbers as vector in the complex plane:
 - a. $(10-3j)$
 - b. $e^{j\pi/6}$
 - c. $\frac{2+2j}{6} - \frac{1-j}{4}$
 - d. $\frac{1}{4j^3}$
 - e. $\frac{1-3j}{-5+4j}$

2. Give numerical answers to each of the following questions:
 - a. Rationalize $\frac{-30k \cdot (j1k)}{30k + j1k}$. Express your answer in rectangular form.
 - b. Find the polar form of $(e^{j45^\circ})^* \left(\sqrt{1+\frac{5}{4}} - j\sqrt{1-\frac{5}{4}} \right)^*$ (Note: The asterisk means conjugate.)
 - c. Find the following phasor: $P[8 \sin(3kt + 115^\circ)]$.
 - d. Find the magnitude of $\frac{(1-4j)2e^{-j50^\circ}}{2+2e^{j90^\circ}}$.
 - e. Find the imaginary part of $\frac{1-5j}{e^{-j60^\circ}}$.

3.
 - a. Write phasors (as both $Ae^{j\phi}$ and $A\angle\phi$) for each of the following signals:
 - i. $v(t)=18\cos(5t+80^\circ)V$
 - ii. $i(t)=4\sin(\omega t+143^\circ)mA$
 - iii. $v(t)=\cos(10t+30^\circ)V+7\sin(10t-30^\circ)V$

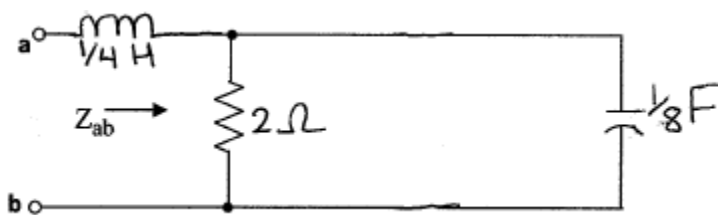
 - b. Given $\omega=9\text{krad/sec}$, write inverse phasors for each of the following signals:
 - i. $\mathbf{I}=56.8e^{j37^\circ} \text{ A}$
 - ii. $\mathbf{V}=-5j^3 \text{ V}$
 - iii. $\mathbf{I}=3e^{+\frac{\pi}{2}-j63^\circ} \text{ A}$

4.



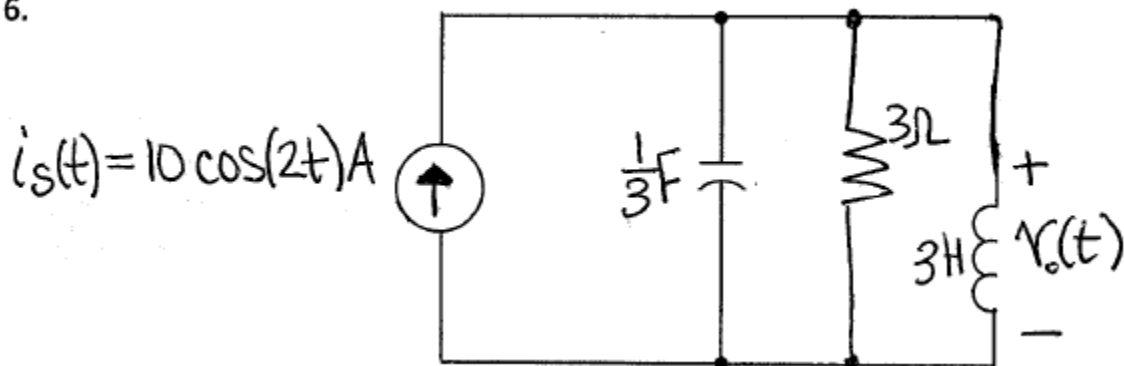
Given $\omega = 2\text{k rad/sec}$, find Z_{ab} .

5.



Given $\omega = 50 \text{ rad/sec}$, find Z_{ab} .

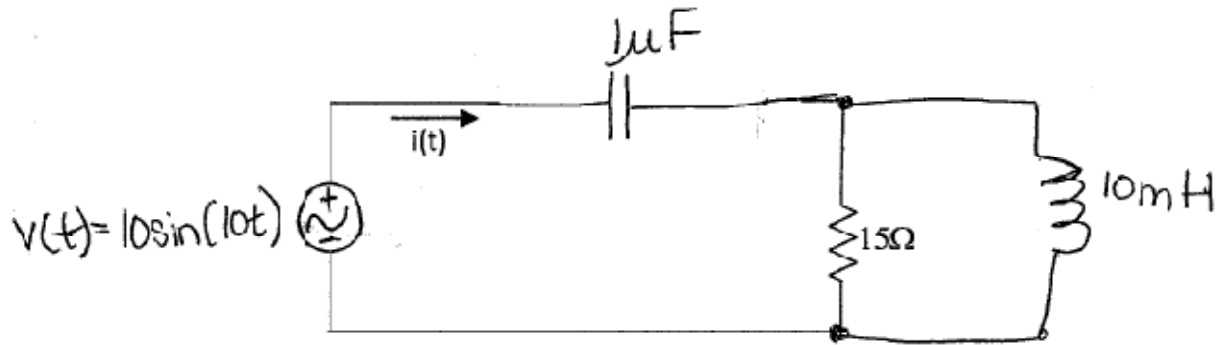
6.



- Find the phasor value for $i_s(t)$.
- Draw the frequency-domain circuit diagram, including the phasor value for $i_s(t)$ and the impedance values for components.

7. Find the phasor value for $V_o(t)$ from the circuit in Problem 6.

8.



- Find the phasor value for $V(t)$.
- Draw the frequency-domain circuit diagram, including the phasor value for $V(t)$ and the impedance values for components.

9. Find the phasor value for $i(t)$ for the circuit in Problem 8.10. Determine I_c for the following circuit. Write the answer in phasor form.