

Homework 7

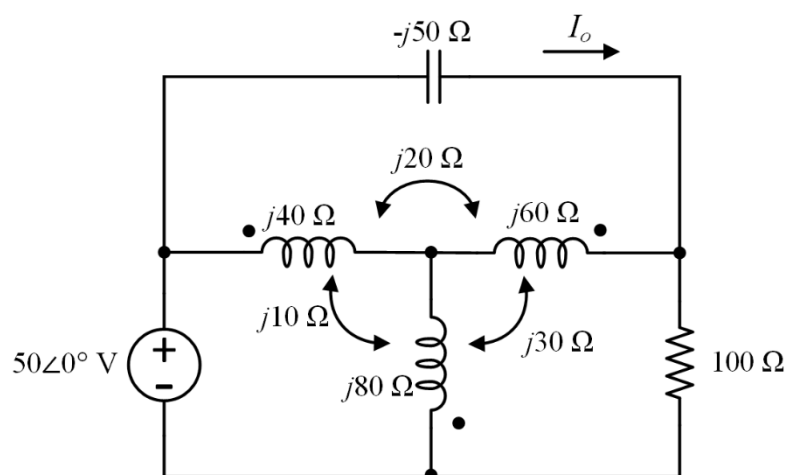
Due time: Dec. 24th, 2024

Hand in your hard-copy hand-writing homework to 1D107 at the beginning of lecture.

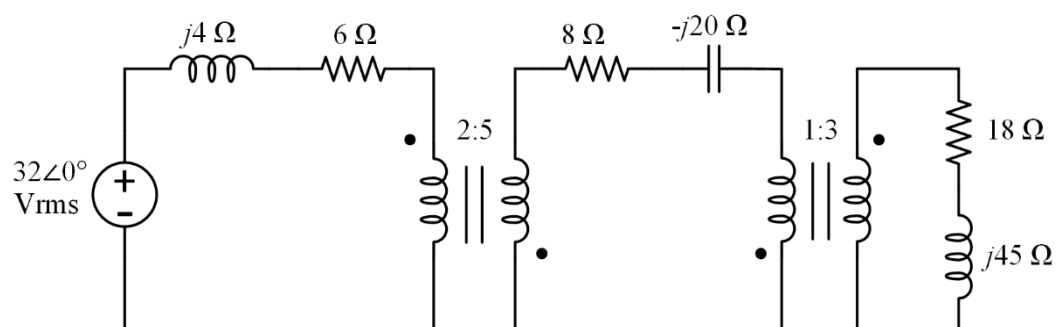
Rules:

- Work on your own. Discussion is permissible, but extremely similar submissions will be judged as plagiarism.
- Please show all intermediate steps: a correct solution without an explanation will get zero credit.
- Please submit on time. No late submission will be accepted.
- Please prepare your submission in **English only**. No Chinese submission will be accepted.
- All final answers must be rounded to **two decimal places**, and include the **appropriate units**.

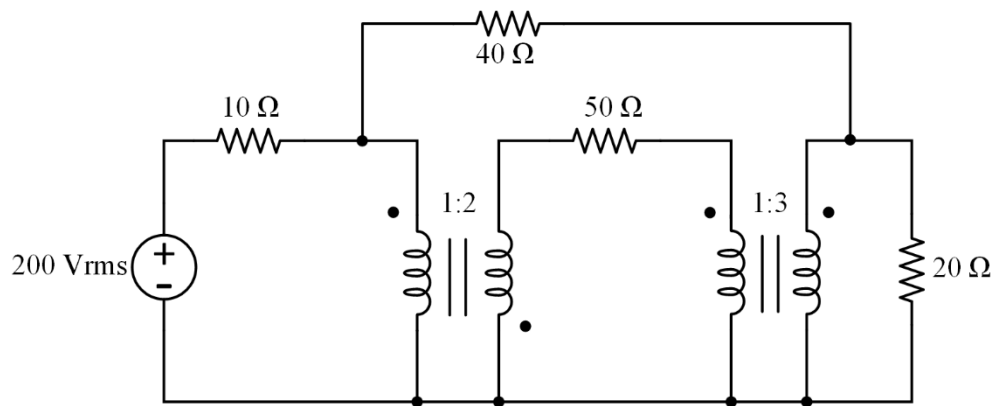
1. For the circuit below, find I_o .



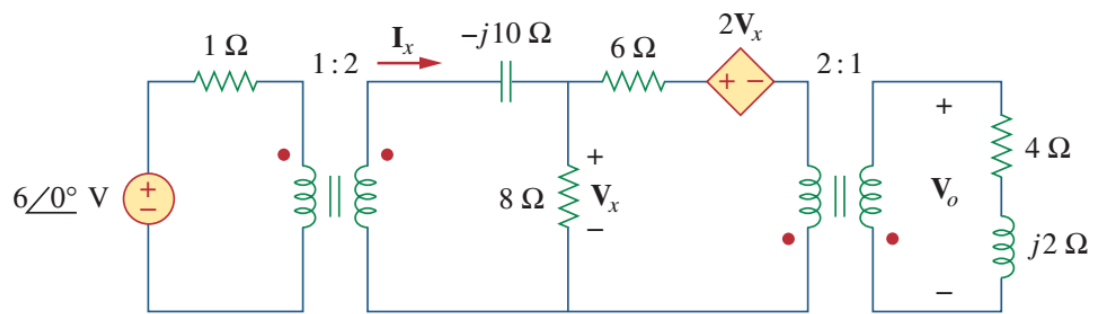
2. In the circuit, find:
- Complex power delivered by the source
 - Average power absorbed by 18Ω resistor.



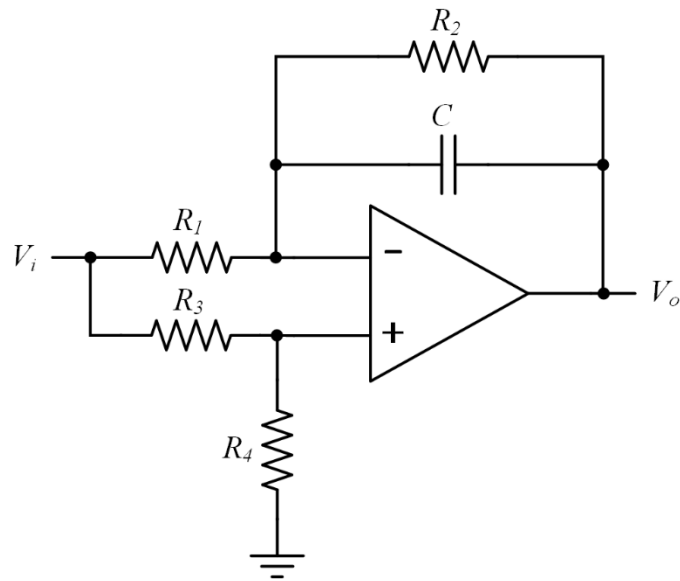
3. In the circuit below, find the average power absorbed by the 20Ω resistor.



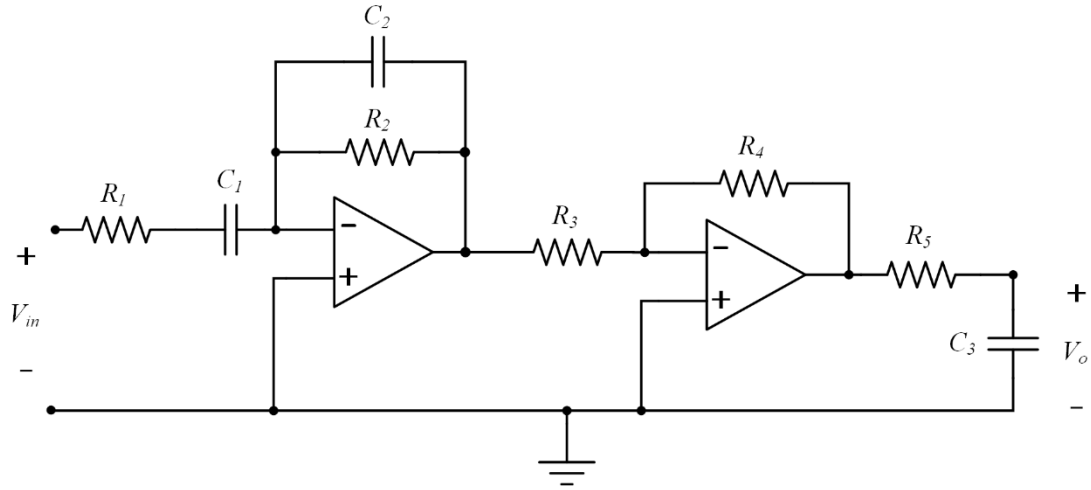
4. Find $\mathbf{I_x}$ and $\mathbf{V_x}$



5.

Find transfer function V_o / V_i for the following circuit.

6. For the circuit shown below, $R_1 = 5\text{ k}\Omega$, $R_2 = 1\text{ k}\Omega$, $R_3 = 10\text{ k}\Omega$, $R_4 = 10\text{ k}\Omega$, $R_5 = 10\text{ k}\Omega$, $C_1 = 5\text{ }\mu\text{F}$, $C_2 = 10\text{ }\mu\text{F}$, $C_3 = 4\text{ }\mu\text{F}$. Find the transfer function $\frac{V_o}{V_{in}}$ for the following circuit.



7. Find the resonant frequency ω_0 , bandwidth B , quality factor Q , of the following two circuits.

