Homework 7

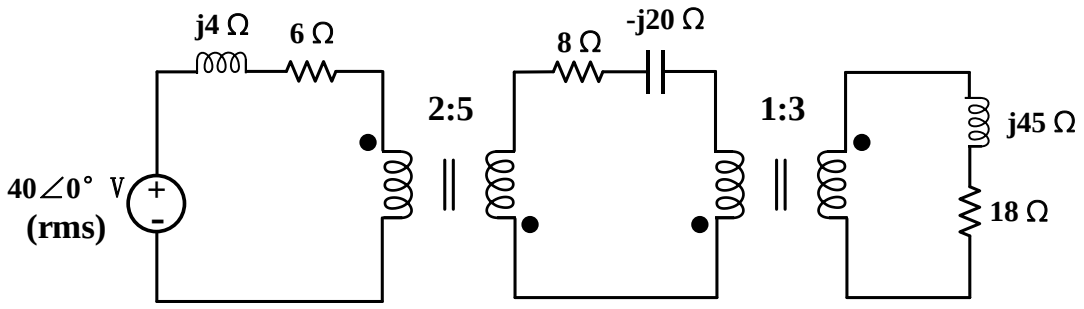
Due date: 8th December

Turn in your homework in class

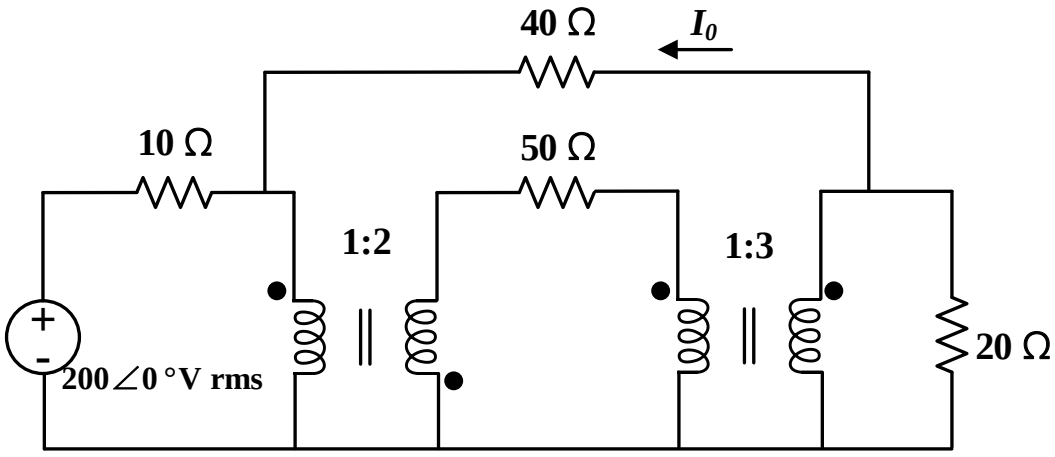
Rules:

- 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.

1. For the circuit below, please find:
   (a) The complex power released by the source.
   (b) The average power delivered to the 18Ω resistor.



2. For the following circuit, please find:
   (1) The complex power released by the independent voltage source.
   (2) The average power absorbed by the 20Ω resistor.
   (3) The current I_0

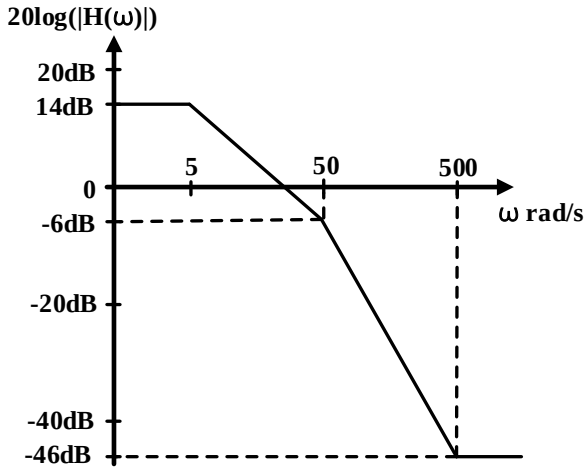


3. Generate Bode **magnitude and phase** plots for the following voltage transfer functions in (1) and (2).

(1) $H(\boldsymbol{\omega}) = \frac{4*10^4(60+j6\boldsymbol{\omega})}{(j2\boldsymbol{\omega}+4)(j2\boldsymbol{\omega}+100)(j4\boldsymbol{\omega}+400)}$

(2) $H(\boldsymbol{\omega}) = \frac{8*10^{-2}(10+j10\boldsymbol{\omega})}{j\boldsymbol{\omega}(16-\boldsymbol{\omega}^2+j4\boldsymbol{\omega})}$

(3) Determine the voltage transfer function H(**ω**) corresponding to the Bode magnitude plot shown below. Note that the phase of H(**ω**) is 0° at **ω=0.**



4. For the circuit below, please find the transfer function H(**ω**)=V_2/V_1, **Also** sketch the magnitude and phase frequency relation of bode plot.