HOMEWORK #16

1. Give numerical answers to each of the following questions:

   a) Rationalize $\dfrac{-65 + j3}{-52 - j39}$. Express your answer in rectangular form.

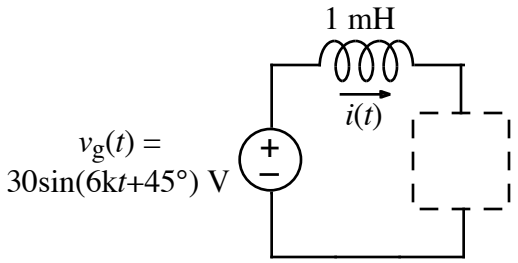
   b) Find the rectangular form of $\left(\dfrac{2}{e^{-j45°}}\right)^*$. (Note: the asterisk means "conjugate".)

   c) Given ω = 9 rad/sec, find the following inverse phasor:

   $$\mathrm{P}^{-1}[6\cos(40°)(1 + \mathrm{j})]$$

   d) Find the magnitude of $\left(\dfrac{j}{4 + j}\right)\left(\dfrac{e^{j15°}}{4 - j}\right)$.

   e) Find the real part of $\dfrac{10e^{j360°}}{j^2}$.

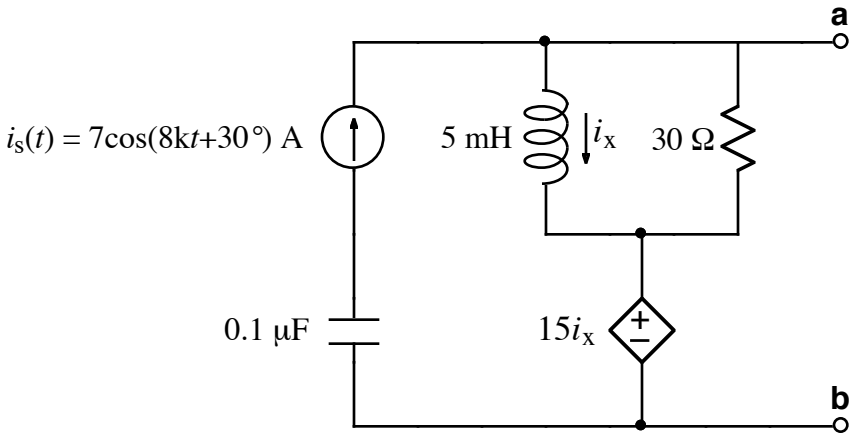
2. 

   Choose an R, an L, or a C to be placed in the dashed-line box to make

   $$i(t) = 0.5\cos(6kt - 135°)\ \text{A}$$

3. State the value of the component you chose for Problem 2. Note that the value of the component cannot be negative.

4.



Draw a frequency-domain equivalent of the above circuit. Show a numerical phasor value for $i_s(t)$, and show numerical impedance values for R, L, and C. Label the dependent source appropriately.

5. Find the Thevenin equivalent (in the frequency domain) for the above circuit. Give the numerical phasor value for $\mathbf{V}_{Th}$ and the numerical rectangular form for the impedance value of z_{Th}.