# EECS/CSE 70A Network Analysis I

Homework #5

Due on or before
5/23/2017, Tuesday 6.00pm ONLINE ONLY

Problem 1: (Phasor) (40pts)

a) Given $v(t) = 5\cos(\omega t - \pi/3)$. Find the phasor **V** that represents $v(t)$. Express **V** as *x+jy* and as $re^{j\varphi}$

b) Given $i(t) = 10\sin(3t + \pi/4)$. Find the phasor **I** that represents $i(t)$. Express **I** as *x+jy* and as $re^{j\varphi}$

c) Convert the phasor **V** = 3+7j to time domain expression v(t).

d) Convert the phasor **I** = 16-9j to time domain expression i(t).

Problem 2: Find $V_C(t)$. Hint: convert the voltage source into a phasor, then find the voltage phasor for the capacitor, then convert back to the time dependent $V_C(t)$ (30pts)

$$v_S(t) = 12\cos(10 \times t + 30°)$$

3kΩ

V_C

+

−

100μF
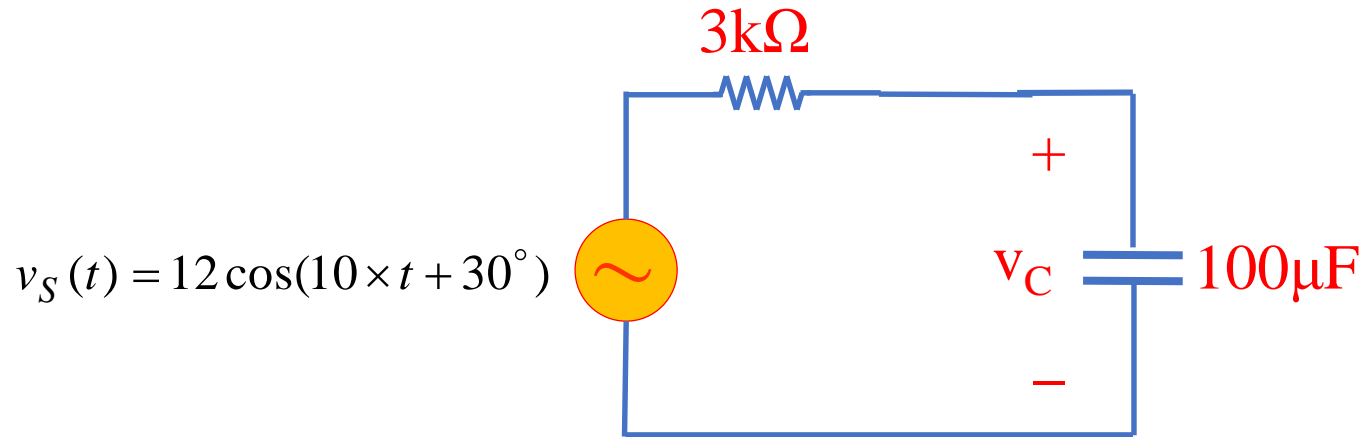
Problem 3: $Z_{eq}(\omega)$ is the equivalent impedance between terminals a-b. (30pts)
Find the parametric expression for $Z_{eq}(\omega)$ as a function of the angular frequency ω and circuit elements (R_1, R_2, C and L). You do not need to simplify the expression.

L=10mH $R_1=2\Omega$

a

$Z_{eq}(\omega)$

$R_2=1\Omega$

C=10mF

b