

WLG

H.W. # 8

(1) Perform the following with your calculator.

(a) Express your answer in polar form. (5 points)

$$G = \frac{(6-j4)(3+j6)}{(2-j8)(20\angle 40^\circ)} = 0.2933 \angle 65.71$$

(b) Express your answer in rectangular form. (5 points)

$$G = \frac{(40\angle 30^\circ)(-9+j7)}{j10(3+j9)(-6+j2)} = -0.6648 - j0.3685$$

(2) Express the following as phasors.

$$(a) v(t) = 5 \cos(100t - 60^\circ) \text{ V} \quad (5 \text{ points})$$

$$(b) v(t) = -10 \sin(\omega t + 30^\circ) \text{ V} \quad (5 \text{ points})$$

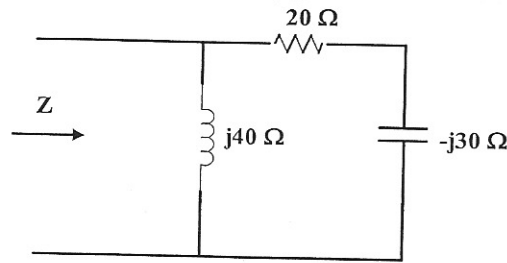
$$(c) i(t) = \text{Re}[50e^{j(\omega t - 90^\circ)}] \text{ A} \quad (5 \text{ points})$$

$$(a) \vec{V} = 5 \angle -60^\circ \text{ V}$$

$$(b) \vec{V} = 10 \cos(\omega t + 120^\circ) \text{ V}$$

$$(c) \vec{I} = 50 \cos(\omega t - 90^\circ)$$

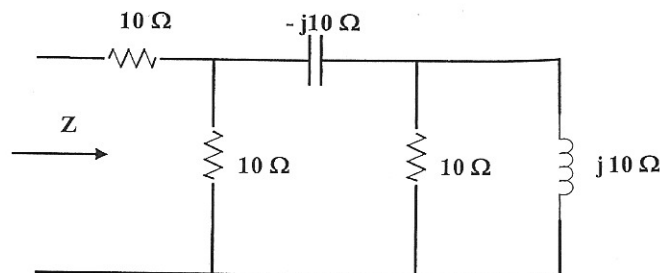
(3) (a)



$$\frac{1}{Z} = (j40) \parallel (20 - j30) = \frac{j40(20 - j30)}{20 + j10}$$

$$\frac{1}{Z} = 64 + j8 = 64.498 \angle 7.125^\circ \Omega$$

(b)



$$10 \parallel j10 = \frac{10 \times j10}{10 + j10} = 5 + j5$$

$$5 + j5 - j10 = 5 - j5$$

$$10 \parallel (5 - j5) = \frac{10(5 - j5)}{15 - j5} = 4 - j2$$

$$10 + 4 - j2$$

$$Z = 14 - j2 \Omega = 14.14 \angle -8.13^\circ \Omega$$