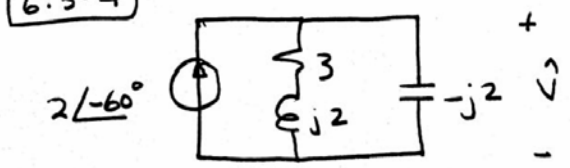
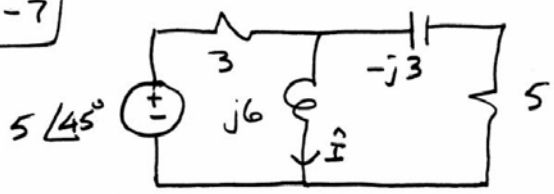
EE204 (062) HW8 solutin

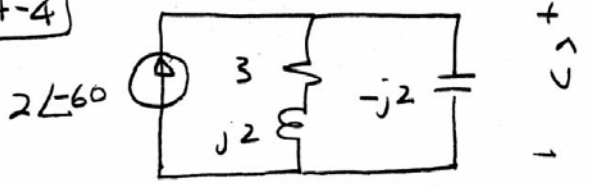
6.3-4



6.3-7



6.4-4



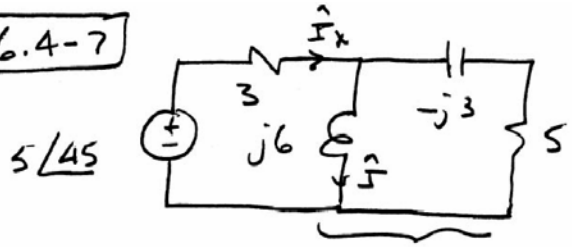
$$\frac{(3+j2)(-j2)}{3+j2-j2} = \frac{4-j6}{3} = \frac{4}{3} - j2$$

$$\hat{V} = \left(\frac{4}{3} - j2\right) 2\angle -60 = 2.4\angle -56.31 \; 2\angle -60$$

$$= 4.81 \angle -116.31^\circ$$

$$v(t) = 4.81 \sin(2t - 116.31^\circ) \text{ V}$$

6.4-7



$$\frac{j6\,(5-j3)}{j6+5-j3} = \frac{6\angle 90 \;\; 5.83\angle -30.96}{5.83\angle 30.96}$$

$$\hat{I}_x = \frac{5\angle 45}{3+5.29+j2.82} \qquad = 6\angle 28.07$$

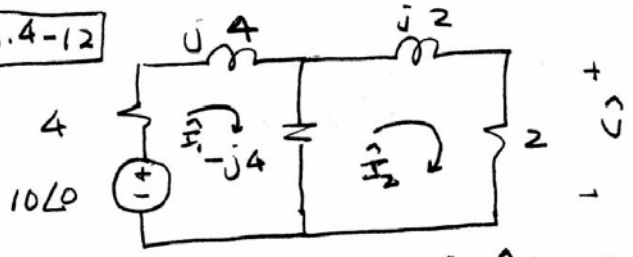
$$= 5.29 + j2.82$$

$$= 0.57\angle 26.20$$

$$\hat{I} = \frac{5-j3}{j6+5-j3}\hat{I}_x = \frac{5.83\angle -30.96}{5.83\angle 30.96}\hat{I}_x = 0.57\angle -35.73^\circ$$

$$\therefore \boxed{i(t) = 0.57\cos(3t - 35.73^\circ)\,A}$$

6.4-12



M1: $(4+j4)\hat{I}_1 + (-j4)(\hat{I}_1 - \hat{I}_2) = 10\angle 0$

$\therefore\ 4\hat{I}_1 + j4\hat{I}_2 = 10\angle 0$

M2: $(2+j2)\hat{I}_2 + (-j4)(\hat{I}_2 - \hat{I}_1) = 0$

$\therefore\ j4\hat{I}_1 + (2-j2)\hat{I}_2 = 0$

$$\hat{I}_2 = \frac{\begin{vmatrix} 4 & 10 \\ j4 & 0 \end{vmatrix}}{\begin{vmatrix} 4 & j4 \\ j4 & (2-j2) \end{vmatrix}} = \frac{-j40}{8-j8+16} = \frac{40\angle -90}{24-j8}$$

$$= 1.58\angle -71.57$$

$\therefore\ \hat{U} = 2\hat{I}_2 = 3.16\angle -71.57$

$\therefore$ **$u(t) = 3.16\cos(2t - 71.57^\circ)$ V**