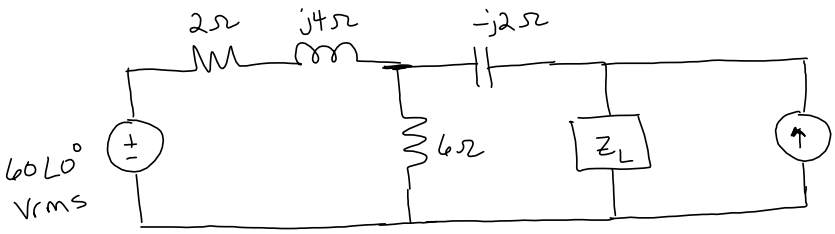
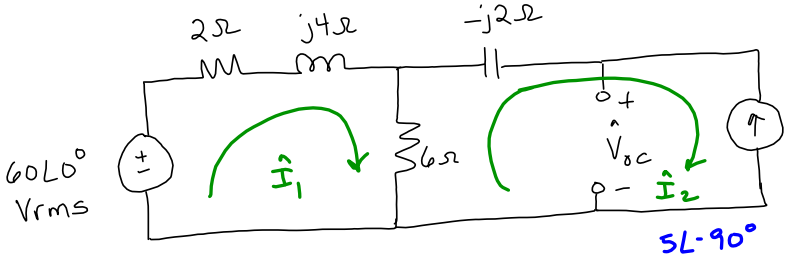


Design Z_L for max. average power.



Know

$\hat{I}_2 = -(5\angle 90)$

$= 5\angle -90^\circ$ Arms

$5\angle -90^\circ$

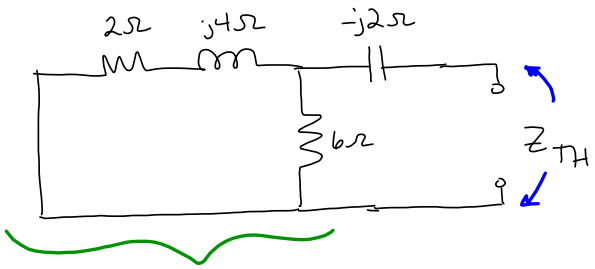
M1: $60\angle 0 - (2+j4)\hat{I}_1 - 6(\hat{I}_1 - \hat{I}_2) = 0$

$\hat{I}_1(-8-j4) = 60\angle 180 - 30\angle -90^\circ$

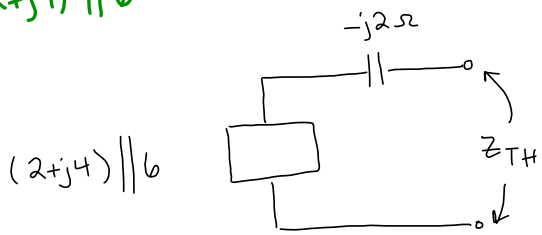
$\hat{I}_1 = 7.5\angle -53.13^\circ$ Arms

M2: $-6(\hat{I}_2 - \hat{I}_1) - (-j2)\hat{I}_2 - \hat{V}_{oc} = 0$

$\hat{V}_{oc} = 37.48\angle -9.21^\circ$ Vrms



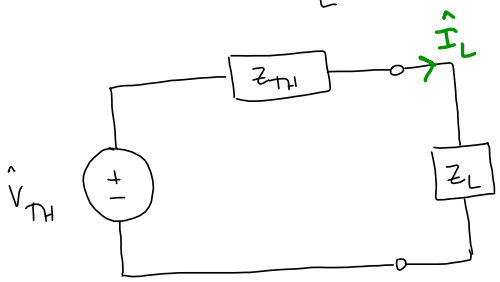
$(2+j4) \| 6$



$$Z_{TH} = ((2+j4) \| 6) + (-j2)$$
$$= 2.41 \angle -4.76^\circ \Omega$$
$$= 2.40 - j0.2 \Omega$$

$Z_L = Z_{TH}^*$

$$Z_L = 2.40 + j0.2 \Omega \text{ or } 2.41 \angle +4.76^\circ \Omega$$



$$\hat{I}_L = \frac{\hat{V}_{TH}}{Z_L + Z_{TH}} = 7.81 \angle -9.21^\circ \text{ Arms}$$

$$P_L = I_L^2 \cdot Re[Z_L]$$

$$P_L = (7.81)^2 (2.40)$$
$$= 146.39 \text{ W, Abs}$$

$$Z_L = Z_{TH}^*$$