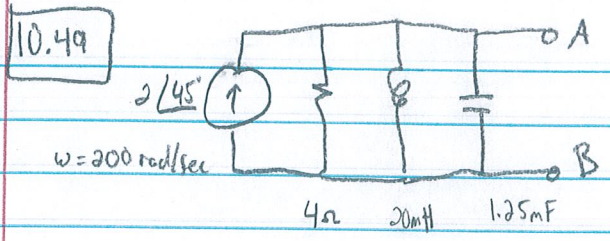
10.49

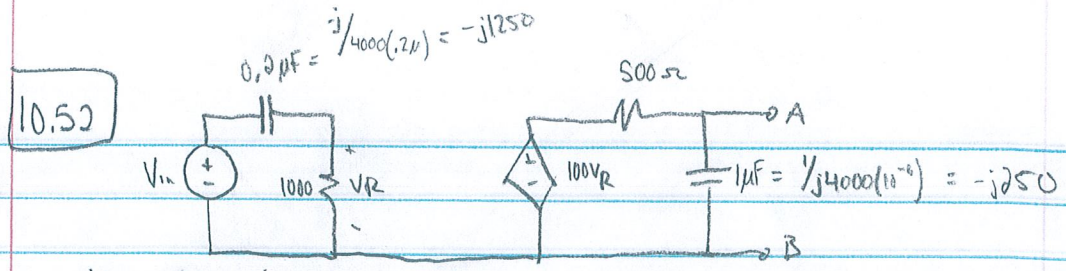


$Z_{th} = R \| L \| C = 4 \| j(200)(.02) \| \frac{1}{j(200)(1.25m)} = \boxed{4 + j0 \ \Omega}$

$i_{sc} = i_{in} = 2\angle 45°.$ $\quad V_{oc} = i_{sc} Z_{th} = 8\angle 45°$

$\boxed{= 8 \cos(200t + 45°) \text{ Volts}}$

10.52



$V_{in} = 50\cos(4000t)$

$\omega = 4000.$

$V_{oc} = V_{AB} = 100V_R\left(\frac{-j250}{500-j250}\right)$ by voltage division. $= V_R(20-j40)$

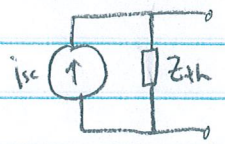
$V_R = V_{in}\left(\frac{1000}{1000-j1250}\right) = V_{in}(.390 + j.488)$

$V_{oc} = V_{in}(.390+j.488)(20-j40) = \boxed{1366 - j292 = 1397\angle -12^\circ \text{ V}}$

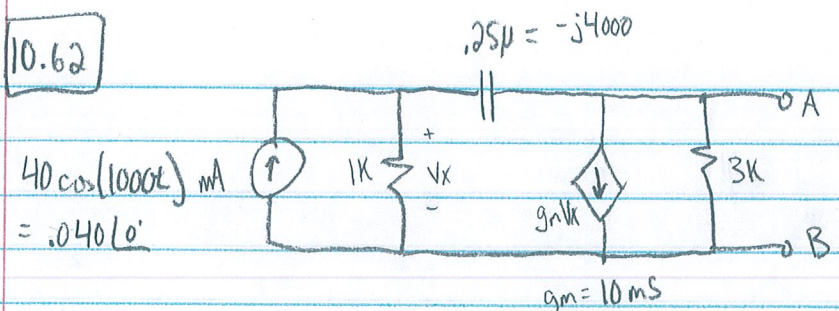
$50\angle 0^\circ$

$i_{sc} = 100V_R/500 = \frac{100(50)}{500}(.390+j.488) = \boxed{3.9 + j4.88 = 6.25\angle 51^\circ \text{ A}}$

$R_{th} = V_{oc}/i_{sc} = \frac{1397\angle -12^\circ}{6.25\angle 51^\circ} = \boxed{223.52\angle -63^\circ\ \Omega}$



10.62



KCL @ V_x: $-.04 + \frac{V_x}{1000} + \frac{V_x - V_A}{-j4000} = 0 \rightarrow V_x\left(\frac{1}{1000} + \frac{j}{4000}\right) + V_A\left(\frac{-j}{4000}\right) = .04$

KCL @ V_A: $\frac{V_A - V_x}{-j4000} + .01V_x + \frac{V_A}{3000} = 0 \rightarrow V_x\left(\frac{-j}{4000} + .01\right) + V_A\left(\frac{j}{4000} + \frac{1}{3000}\right) = 0$

$V_x = 4.027 - j4.232$

$V_A = -12.9 + j139.6 = \boxed{140.25\angle 95.28^\circ \text{ volts}} = V_{oc}$

Find I_{sc}: $V_A = 0$.

KCL @ V_x: $-.04 + V_x/1000 + V_x/-j4000 = 0 \rightarrow V_x = 37.65 - j9.41$

KCL @ V_A: $\frac{-V_x}{-j4000} + .01V_x + I_{sc} = 0$

$\rightarrow I_{sc} = -.01(37.65 - j9.41) + \frac{(37.65 - j9.41)}{-j4000}$

$= -.374 + j.104 = \boxed{.388\angle 164.5^\circ}$

$Z_{th} = V_{oc}/I_{sc} = \frac{140.25\angle 95.28^\circ}{.388\angle 164.5^\circ} = \boxed{128 - j337.86\ \Omega}$