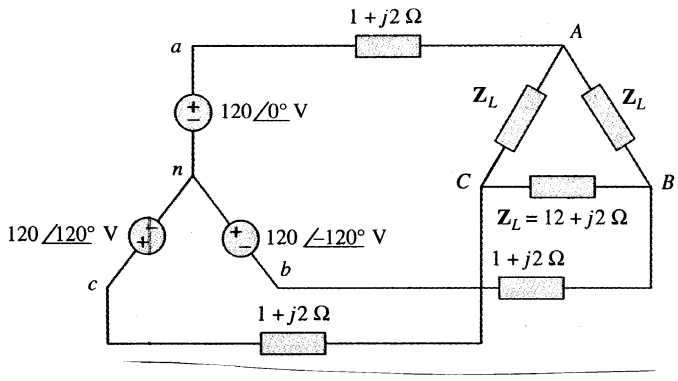
GIVEN:

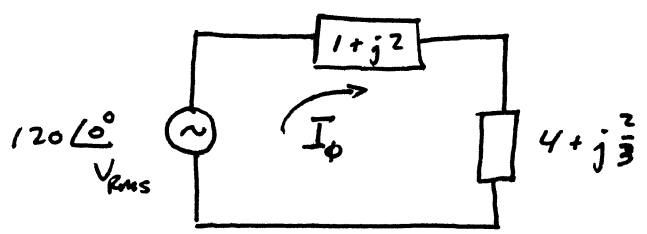


FIND: LINE CURRENTS

SOLN: SINCE WE HAVE A Y-Δ WE CONVERT Δ LOAD TO Y

$$Z_Y = \frac{Z_\Delta}{3} \rightarrow Z_L = 4 + j\tfrac{2}{3}\ \Omega$$

ON A PER-ϕ BASIS...



FOR Y-Y : $I_\phi = I_L$

$$\text{So,}\quad I_\phi = \frac{120\angle 0^\circ}{(1+j2)+(4+j\,2/3)} = 21.2\angle -28.1^\circ\ A_{RMS}$$

$$\therefore\quad I_{La} = \underline{21.2\angle -28.1^\circ\ A_{RMS}}$$

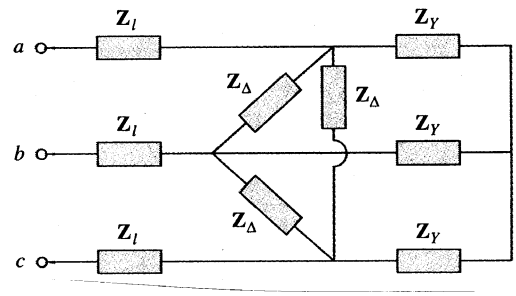
SINCE WE HAVE A BALANCED SYSTEM

$$I_{Lb} = \underline{21.2\angle -148.1^\circ\ A_{RMS}}$$

$$I_{Lc} = \underline{21.2\angle 91.9^\circ\ A_{RMS}}$$

TOPS 35510 - 100 sheets 35520 - 200 sheets

GIVEN:



$Z_L = 1 + j1\ \Omega$ $\qquad$ $Z_\Delta = 24 - j30\ \Omega$

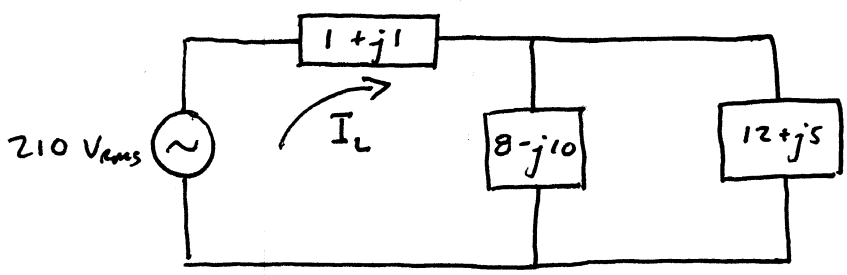
$Z_Y = 12 + j5\ \Omega$

$V_L = 210\ V_{RMS}$ $\quad$ BALANCED

FIND: $|I_L|$

SOLN: CONVERT Z_Δ TO EQUIVALENT Z_Y $\qquad Z_Y = \frac{Z_\Delta}{3} = 8 - j10\ \Omega$

AND ON A PER PHASE BASIS...

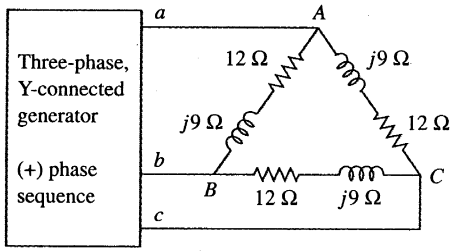


TOTAL LOAD IS $(1+j1) + (8-j10) // (12+j5)$

$Z_T = 8.812 - j1.047\ \Omega$

AND $|I_L| = \dfrac{210}{|Z_T|} = \underline{23.66\,A_{RMS}}$

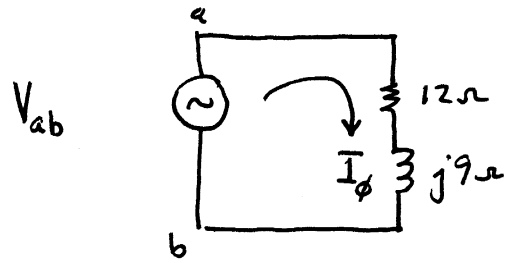
GIVEN:



$V_{an} = 440 \angle 60^\circ$ POSITIVE SEQUENCE

FIND: LOAD PHASE CURRENTS

SOLN: SINCE LOAD IS Δ, PHASE CURRENTS WILL NOT BE LINE CURRENTS... THEREFORE, ANALYZE ON AS



NOW, $V_{ab} = V_{an}(\sqrt{3}\angle 30) = 762.1 \angle 30^\circ \; V_{RMS}$

$$I_{AB} = I_\phi = \frac{762.1 \angle 30^\circ}{12 + j9} = 50.81 \angle -6.87^\circ \; A_{RMS}$$

SINCE POS. SEQ.

$$I_{BC} = 50.81 \angle -126.87^\circ \; A_{RMS}$$

$$I_{CA} = 50.81 \angle 113.13^\circ \; A_{RMS}$$

TOPS 35510 - 100 sheets 35520 - 200 sheets