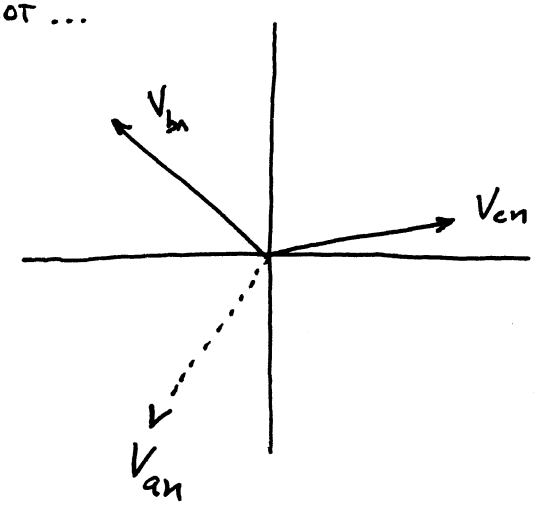
GIVEN: $V_{bn} = 208 \angle 130^\circ \; V_{RMS}$ $V_{cn} = 208 \angle 10^\circ \; V_{RMS}$

FIND: A) PHASE SEQUENCE

B) V_{an}

SOLN: A) LET'S PLOT ...



RECALL PHASORS ROTATE CCW @ ω SO

IF WE "LOOK DOWN" WE "SEE"

V_{an}, V_{bn}, V_{cn} abc OR POSITIVE SEQUENCE

B) $V_{an} = 208 \angle -110^\circ \; V_{RMS}$

120° SEPERATED FROM OTHERS.

SAME MAG. SINCE "BALANCED"

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GIVEN: BALANCED WYE SYSTEM

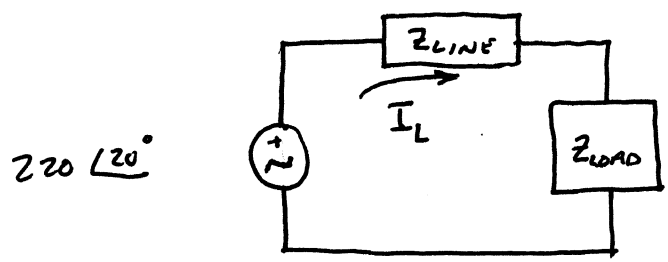
abc SEQUENCE $V_{an} = 220 \angle 20^\circ \; V_{RMS}$

$Z_{LINE} = 0.6 + j1.2 \, \Omega$

$Z_{LOAD} = 10 + j14 \, \Omega$

FIND: A) I_L B) V_L

SOLN: A) ON A "PER-PHASE" BASIS... SAY FOR PHASE "a"



THE PER-PHASE CURRENT IS THE LINE CURRENT!

SO,
$$I_L = \frac{220 \angle 20^\circ}{(0.6 + j1.2) + (10 + j14)} = 11.87 \angle -35.1^\circ \; A_{RMS}$$

FOR LINE b: $I_L = 11.87 \angle -155.1^\circ$
LINE C: $I_L = 11.87 \angle 84.9^\circ$
} FOR abc SEQUENCE

B) FOR LINE VOLTAGES...

$$V_{ab} = (\sqrt{3} \angle 30) V_{an} = 381 \angle 50^\circ \; V_{RMS}$$

$$V_{bc} = 381 \angle -70^\circ \; V_{RMS}$$

$$V_{ca} = 381 \angle 120^\circ \; V_{RMS}$$

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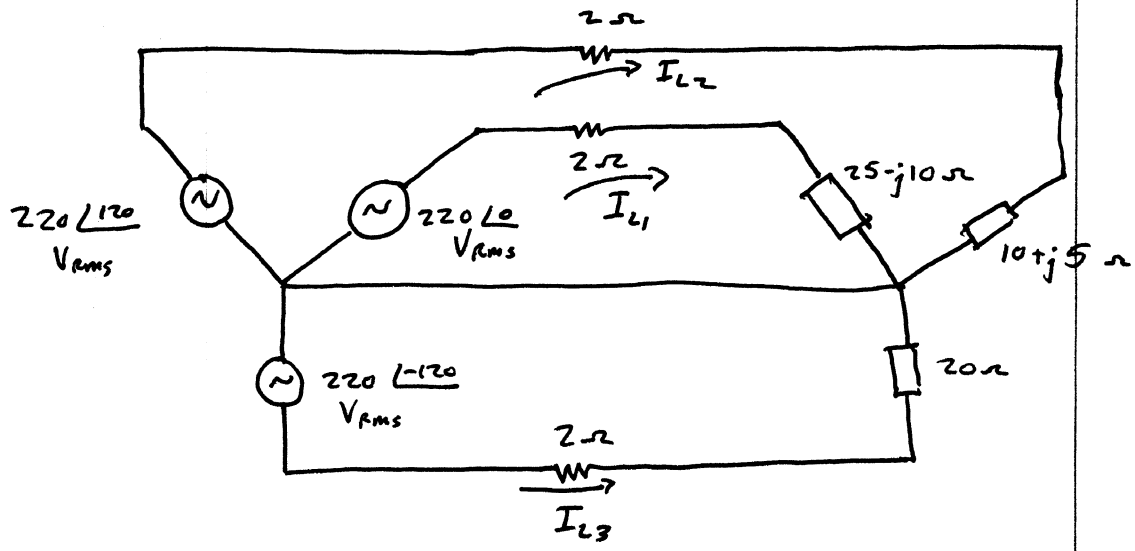
GIVEN:



FIND: I_n

SOLN: NOTICE ALTHOUGH WE HAVE BALANCED 3Φ VOLTAGES AND BALANCED LINE Z WE DO NOT HAVE A BALANCED SYSTEM ~ Z_{LOAD} IS NOT BALANCED!

AS A RESULT...

$$I_n = I_{L1} + I_{L2} + I_{L3}$$

$$I_{L1} = \frac{220\angle 0}{2 + 25 - j10} = 7.64\angle 20.3^\circ \text{ A}_{RMS}$$

$$I_{L2} = \frac{220\angle 120}{2 + 10 + j5} = 16.92\angle 97.4^\circ \text{ A}_{RMS}$$

$$I_{L3} = \frac{220\angle -120}{2 + 20} = 10\angle -120^\circ \text{ A}_{RMS}$$

AND

$$I_n = 10.77\angle -90^\circ \text{ A}_{RMS}$$

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