Serial # 0

- 1 points for not writing your serial number

King Fahd University of Petroleum & Minerals
Electrical Engineering Department
EE205: Electric Circuit II (082)
Quiz 1: Balanced Three Phase Y-Connected Systems

Name: KEY Ver. 1

The magnitude of the line voltage at the terminals of a balanced Y-connected load is 12,800 V. The load impedance is 216+*j*63 Ω/Ø. The load is fed from a line that has an impedance of 0.25+*j*2 Ω/Ø. Assume the sequence is negative.

a) If $\mathbf{V}_{AB}$ is the reference voltage, what is $\mathbf{V}_{BC}$ and $\mathbf{V}_{CA}$

$V_{AB} = 12,800 \angle 0^\circ$ V , $V_{BC} = 12,800 \angle 120^\circ$, $V_{CA} = 12,800 \angle -120^\circ$

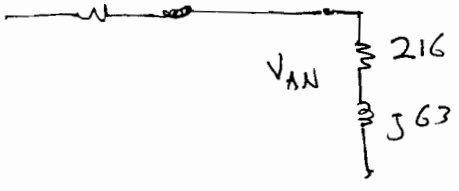
b) Find $\mathbf{V}_{AN}$.

$V_{AB} = \sqrt{3}\, V_{AN} \angle -30^\circ$

$\Rightarrow V_{AN} = \frac{V_{AB}}{\sqrt{3}} \angle 30^\circ = \frac{12,800}{\sqrt{3}} \angle 30^\circ = \boxed{7390.08 \angle 30^\circ \text{ V}}$

c) What is the magnitude of the line current?

$I_{aA} = \frac{V_{AN}}{216+j63} = \frac{12,800/\sqrt{3} \angle 30^\circ}{216+j63}$



$\boxed{|I_{aA}| = 32.845 \text{ A}}$

d) What is the magnitude of the line voltage at the source?

$|V_{aN}| = |I_{aA}(216+j63+0.25+j2)| = 7416.61$ V

$|V_{ab}| = \sqrt{3}\,|V_{aN}| = \boxed{12,845.94 \text{ V}}$

Good Luck, **Dr. Ali Muqaibel**