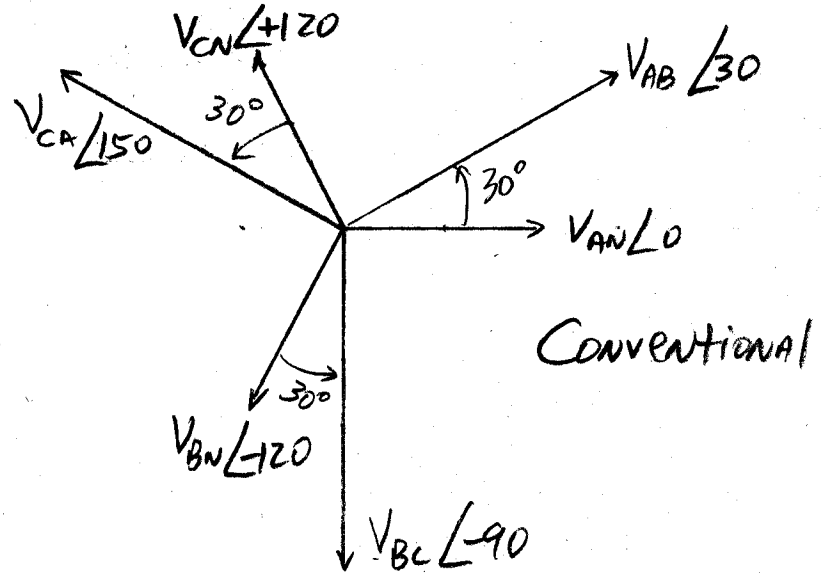
2.6 The phasor diagram with $V_{AN}\angle 0$ is



Since we're given that $\tilde{V}_{CA}$ has angle (-120) instead of angle (150) (As above), all we have to do is work the problem with the conventional angles and then adjust by adding $X°$, where $X° = (-120 - 150) = -270 = 90°$

$$\tilde{V}_{AN} = \frac{208}{\sqrt{3}}\angle 0 = 120\angle 0, \quad \tilde{I}_A = \frac{\tilde{V}_{AN}}{Z} = \frac{120\angle 0}{10\angle -15°} = 12.0\angle +15°$$

$$S_{1\phi} = V_{AN} I_A^* = (120\angle 0)(12.0\angle -15) = 1440\angle -15° \text{ VA} = 1391 \text{ W} - j\,373 \text{ VAr}$$

$$\boxed{S_{3\phi} = 3S_{1\phi} = 4320\angle -15° \text{ VA}}$$

Shifting the conventional angles and answers yields

$\tilde{V}_{AN} = 120\angle 0 \rightarrow 120\angle 90° \text{ V}$, $\tilde{I}_A = 12\angle +15° + 90° = 12\angle 105° \text{ A}$

$\tilde{V}_{BN} = 120\angle 90 - 120 = 120\angle -30° \text{ V}$, $\tilde{I}_B = 12\angle 105° - 120 = 12\angle -15° \text{ A}$

$\tilde{V}_{CN} = 120\angle 90 + 120 = 120\angle 210 \text{ V} = 120\angle -150° \text{ V}$, $\tilde{I}_C = 12\angle 105° + 120 = 12\angle 225° \text{ A} = 12\angle -135° \text{ A}$

Add 30° → $\tilde{V}_{AB} = 208\angle 90 + 30 \text{ V}$

Add 30° → $\tilde{V}_{BC} = 208\angle -30 + 30 \text{ V}$

Add 30° → $V_{CA} = 208\angle -150 + 30 \text{ V}$