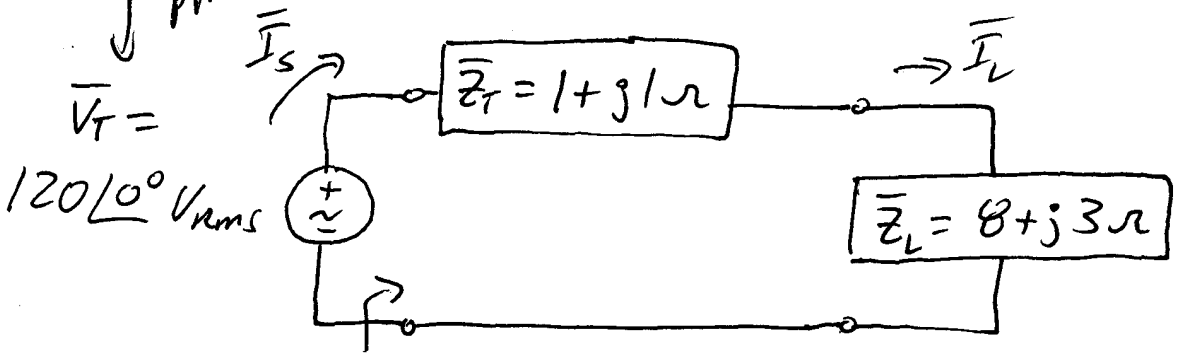
ex. RMS Phasor!



$\bar{Z}_{eq} = (1+j1)+(8+j3) = 9+j4\,\Omega$

$= 9.84886\angle 23.96249^\circ\,\Omega$

$$\bar{I}_s = \bar{I}_L = \frac{\bar{V}_T}{\bar{Z}_{eq}} = \frac{120\angle 0^\circ}{9.85\angle 24^\circ} = 12.184154\angle -23.96249^\circ \text{ A}_{rms}$$

↑ I_{rms}

Apparent Power to load from source

$S = V_{rms} I_{rms} = 120(12.184)$

$S = 1462.1$ VA

Power Factor 'seen' by source of total load

$pf = \cos\theta_z = \cos(\theta_v - \theta_i)$

$= \cos 23.96^\circ = \cos(0-(-23.96^\circ))$

$pf = 0.9138$ lagging

↑ R-L load!

$P_{ave,source} = Re\{\bar{V}_{rms} I^*_{rms}\} = Re\{(120\angle 0^\circ V_{rms})(12.184\angle +23.96^\circ)\}$

$= Re\{1336.1 + j593.83\} = 1336.1$ W supplied

$P_{ave,load} = I^2_{L,rms} R_L = (12.184)^2 8 = 1187.6$ W absorbed

$P_{ave,Z_T} = I^2_{s,rms} R_T = (12.184)^2 1 = 148.45$ W absorbed