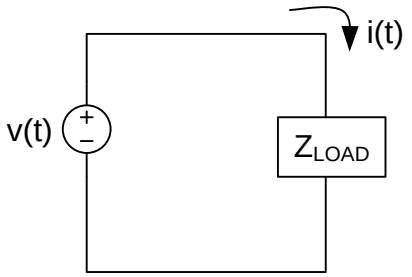


If $v(t) = 155.6\cos(2\pi 60t + 85°)\,V$
and $i(t) = 565.7\cos(2\pi 60t + 15°)\,mA$

Find

a) V_{RMS} and I_{RMS} phasors.

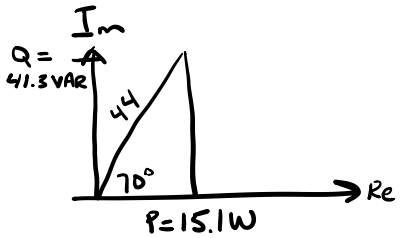
$\underline{V}_{RMS} = \frac{155.6}{\sqrt{2}}\angle 85°\,V_{RMS} = \boxed{110\angle 85°\,V_{RMS}}$

$\underline{I}_{RMS} = \frac{565.7}{\sqrt{2}}\angle 15°\,A_{RMS} = \boxed{400\angle 15°\,mA_{RMS}}$

b) Complex power phasor (include units). Draw power triangle.

$\underline{S} = \underline{V}_{RMS}\,\underline{I}^*_{RMS} = (110\angle 85°)(0.4\angle -15°) = \boxed{44\angle 70°\,VA}$ OR

$= \boxed{15.1 + j\,41.3\,VA}$



c) Apparent power (include units).

$S = |\underline{S}| = \boxed{44\,VA}$

d) Real power (include units).

$P = Re\{\underline{S}\} = 44\cos(70°) = \boxed{15.1\,W}$ (or, from triangle above)

e) Reactive power (include units).

$Q = Im\{\underline{S}\} = 44\sin(70°) = \boxed{41.3\,VAR}$ (or, from triangle above)

f) Power factor (include leading or lagging).

$pf = \cos(70°) = \boxed{0.342 \text{ lagging}}$ since $\theta_I = 15° < \theta_V = 85°$

g) Load impedance in Ω.

$$Z_{LOAD} = \frac{V_{LOAD}}{I_{LOAD}} = \frac{155.6\angle 85°}{565.7\angle 15°} = \boxed{94 + j258\ \Omega}$$

h) Model of load impedance as series RL or RC.

$R = 94\ \Omega$

$L: j\omega L = j2\pi 60L = j258 \Rightarrow L = \frac{258}{2\pi 60} = 0.684$

i) Average power dissipated in load (include units)

$P_{ave} = P = \boxed{150 W}$ from part d