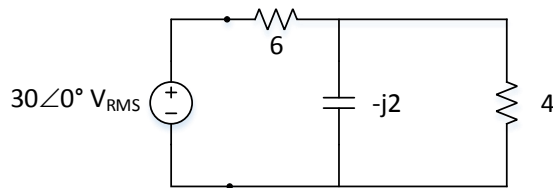


1.)



- a) Find power factor of load as seen by the source. Include whether leading/lagging

$$\begin{aligned}
 Z_L &= 6 + 4 \parallel -j2 \\
 &= 6 + \frac{-j8}{4-j2} \\
 &= 6.8 - j1.6
 \end{aligned}$$

$$\begin{aligned}
 \text{So } I_s &= \frac{V_s}{Z_L} = \frac{30 \text{ V}_{\text{RMS}}}{6.8 - j1.6} = 4.29 \angle 13.2^\circ \text{ A}_{\text{RMS}} \\
 \text{pf} &= \cos(\theta_V - \theta_I) \\
 &= \cos(-13.2^\circ) \\
 &= \boxed{0.973 \text{ leading}} \quad (\text{Since } \theta_I > \theta_V)
 \end{aligned}$$

- b) Find apparent power delivered by source. Include units.

$$\begin{aligned}
 S &= V_{\text{RMS}} \cdot I_{\text{RMS}} \\
 &= (30 \text{ V}_{\text{RMS}})(4.29 \text{ A}_{\text{RMS}}) \\
 &= \boxed{129 \text{ VA}}
 \end{aligned}$$

- c) Find average power delivered by source. Include units.

$$\begin{aligned}
 P_{\text{ave}} &= S \cdot \text{pf} \\
 &= (129)(0.973) \\
 &= \boxed{125 \text{ W}}
 \end{aligned}$$