

Chapter 11, Solution 60.

$$S_1 = 20 + j \frac{20}{0.8} \sin(\cos^{-1}(0.8)) = 20 + j15$$

$$S_2 = 16 + j \frac{16}{0.9} \sin(\cos^{-1}(0.9)) = 16 + j7.749$$

$$S = S_1 + S_2 = 36 + j22.749 = 42.585 \angle 32.29^\circ$$

But $S = V_o I^* = 6 V_o$

$$V_o = \frac{S}{6} = \mathbf{7.098 \angle 32.29^\circ}$$

$$\text{pf} = \cos(32.29^\circ) = \mathbf{0.8454 \quad (\text{lagging})}$$