Chapter 11, Solution 44.

$$40\mu F \longrightarrow \frac{1}{j\omega C} = \frac{1}{j2000x40x10^{-6}} = -j12.5$$

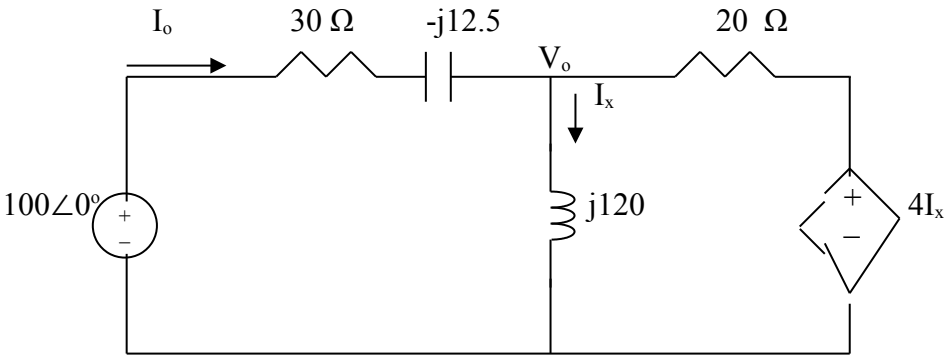
$$60mH \longrightarrow j\omega L = j2000x60x10^{-3} = j120$$

We apply nodal analysis to the circuit shown below.

$$\frac{100 - V_o}{30 - j12.5} + \frac{4I_x - V_o}{20} = \frac{V_o}{j120}$$

But $I_x = \frac{V_o}{j120}$. Solving for V_o leads to

$$V_o = 2.9563 + j1.126$$



$$I_o = \frac{100 - V_o}{30 - j12.5} = 2.7696 + j1.1165$$

$$S = \frac{1}{2}V_s I_o^* = \frac{1}{2}(100)(2.7696 - j.1165) = \underline{138.48 - j55.825 \ \text{VA}}$$

S = (138.48 – j55.82) VA