

$$1. \quad 156 \angle 60^\circ$$

$$220 \angle -45^\circ$$

$$2. \quad V_1(t) = 20 \cos(20t + 15^\circ)$$

$$V_2(t) = 10 \cos(20t + 45^\circ)$$

$$V_3(t) = 29.1 \cos(20t + 24.9^\circ)$$

$$3. \quad \omega = 400$$

$$\bar{Z}_L = j80 \, \Omega$$

$$\bar{Z}_{Total} = 177.58 + j68.97 \, \Omega$$

$$4. \quad \bar{Z}_{eq} = ~~200~~ 50 - j1970 \, \Omega$$

$$~~200~~$$

$$5. \quad \omega = 200 \frac{\text{rad}}{\text{sec}}$$

$$6. \quad \bar{V}_1 = 334.53 \angle 66.47^\circ$$

$$\bar{V}_2 = 125.37 \angle 109.78^\circ$$

$$7. \quad \bar{Z}_{th} = 7.07 \angle -45^\circ$$

$$\bar{V}_{th} = 21.21 \angle -45^\circ$$

$$8. \quad \bar{I}_n = \bar{I}_{sc} = 3 \angle 0^\circ$$

$$9. \quad \bar{Z} = 20 + j40 \, \Omega$$

$$\bar{I}_R = 1.6 \angle 30^\circ \text{ A}$$

$$\left. \begin{array}{l} V_{rms} = 113.14 \text{ V} \\ I_{rms} = 1.13 \text{ A} \end{array} \right\} \text{ through the resistor}$$

$$P_{average} = 127.85 \text{ W}$$

$$P_{reactive} = 0 \text{ W}$$

10.

$$H(f) = \frac{1}{1 + j\left(\frac{f}{400}\right)}$$

$$|H(f)|_{dB} = 20 \log |H(f)| = 20 \log \left| \frac{1}{\sqrt{1 + \left(\frac{f}{400}\right)^2}} \right|$$