Chapter 33 Even Answers

2. (a) 193 Ω (b) 144 Ω

4. (a) 25.3 rad / s (b) 0.114 s

6. $I = 1.25$ A and $R = 96.0\ \Omega$ for lamps 1 and 2; $I = 0.833$ A and $R = 144\ \Omega$ for lamp 3

8. 7.03 H

10. 3.14 A

12. 3.80 J

14. (a) $f > 41.3$ Hz (b) $X_C < 87.5\ \Omega$

16. $\sqrt{2}C(\Delta V_{\max})$

18. –32.0 A

20. 2.79 kHz

22. (a) 109 Ω (b) 0.367 A (c) 0.367 A, 100 rad / s, –51.3°

24. 1.88 V

26. See solution.

28. (a) 2.00 A (b) 160 W (c) $I_{rms}{}^2 R = 160$ W

30. 353 W

32. (a) 5.43 A (b) 0.905

(c) 281 μF (d) 109 V

34. $\sqrt{\dfrac{800\rho d\mathrm{P}}{\pi(\Delta V_{rms})^2}}$

36. 46.5 pF to 419 pF

38. (a) 3.56 kHz (b) 5.00 A

(c) 22.4 (d) 2.24 kV

40. $\dfrac{4\pi(\Delta V_{rms})^2 RC\sqrt{LC}}{4R^2C + 9.00L}$

42. (a) 9.23 V (b) 4.55 A (c) 42.0 W

44. (a) 1600 windings (b) 30.0 A (c) 25.3 A

46. (a) 83.3 (b) 54.0 mA (c) 185 kΩ

48. (a) $\cong 1.00$ (b) 0.346

50. 8.42 Hz

56. 99.6 mH

58. (a) $\frac{\Delta V_{\max}}{R}\cos\omega t$ (b) $\frac{1}{2}\frac{(\Delta V_{\max})^2}{R}$ (c) $\frac{\Delta V_{\max}\cos\left[\omega t + \text{Arctan}\left(\frac{\omega L}{R}\right)\right]}{\sqrt{R^2+\omega^2 L^2}}$

(d) $C = \frac{1}{\omega_0{}^2 L}$ (e) R (f) $\frac{(\Delta V_{\max})^2 L}{2R^2}$

(g) $\frac{1}{2}L\frac{(\Delta V_{\max})^2}{R^2}$ (h) $\arctan\left(\frac{3}{2R}\sqrt{\frac{L}{C}}\right)$ (i) $\frac{1}{\sqrt{2LC}}$

60. (a) 1.25 A (b) Current lags voltage by 46.7°

62. (a) 224 rad/s (b) 500 W (c) 221 rad/s and 226 rad/s

64. 58.7 Hz or 35.9 Hz

68. (a) 173 Ω (b) 8.66 V

70. See solution.