Chapter 27 Even Answers

2. 3.64 h

4. (a) See solution (b) 1.05 mA

6. $\frac{q\omega}{2\pi}$

8. 0.265 C

10. (a) 2.21×10^{-7} m (b) No. Their electrostatic repulsion is measured by a potential of only 6.49 mV.

12. 0.130 mm/s

14. (a) 3.75 kΩ (b) 536 m

16. 0.0181 Ω · m

18. (a) $\sim10^{18}\ \Omega$ (b) $\sim10^{7}\ \Omega$ (c) $\sim10^{-16}$ A, $\sim10^{9}$ A

20. R / 9

22. $r_{Al} / r_{Cu} = 1.29$

24. 378 Ω

26. (a) unaffected (b) doubles

(c) doubles (d) unchanged

28. 1.98 A

30. $R_n = 5.56\ \text{k}\Omega,\ R_c = 4.44\ \text{k}\Omega$

32. 1.71 Ω

34. 0.153 Ω

36. $2.52\times10^{3}\ ^\circ\text{C}$

38. 448 A

40. $\frac{(\Delta V)^2 \Delta t}{mc(T_2 - T_1)}$

42. (a) 3.17 m (b) 340 W

44. (a) 0.660 kWh (b) 3.96 cents

46. 295 metric ton / h

48. 672 s

50. \$2.88 / day

52. (a) 576 Ω, 144 Ω (b) 4.80 s, lower potential energy

(c) 0.0400 s, changes to heat and light (d) \$1.26, energy at 1.94×10^{-8} \$ / J

54. 50.0 MW

56. 1.56 cm

58. (a) 116 V (b) 12.8 kW (c) 436 W

60. (a) $\frac{V}{L}\,\mathbf{i}$ (b) $\frac{4\rho L}{\pi d^2}$

(c) $\frac{V\pi d^2}{4\rho L}$ (d) $\frac{V}{\rho L}\,\mathbf{i}$

62. 2.00 Ω

64. (a) $\frac{R_0\left[1+\alpha(T-T_0)\right]\left[1+\alpha'(T-T_0)\right]}{\left[1+2\alpha'(T-T_0)\right]}$ (b) 1.08 Ω changes to 1.420 Ω, or more precisely 1.418 Ω

66. (a) $\frac{\rho L}{\pi\left(r_b^{\,2}-r_a^{\,2}\right)}$ (b) 37.4 MΩ

(c) $\frac{\rho}{2\pi L}\ln\left(\frac{r_b}{r_a}\right)$ (d) 1.22 MΩ