

Section 2.4

Solutions to Selected Exercises

1.
 - a. $0.4 = 4 \times 10^{-1}$
 - b. $.00000056 = 5.6 \times 10^{-7}$
 - c. $59.5 = 5.95 \times 10$
 - d. $-8^{-1} = .125 = 1.25 \times 10^{-1}$
 - e. $3,175,432 \approx 3.18 \times 10^6$

3.
 - a. $23(16)^{-1} = 1.44 \times 10^0$
 - b. $323,000,000 = 3.23 \times 10^8$
 - c. $6^{-1} \approx 1.67 \times 10^{-1}$
 - d. $.000000017 = 1.7 \times 10^{-8}$
 - e. $-5^{-2} = -\frac{1}{25} = -.04 = -4.0 \times 10^{-2}$

5.
$$\frac{16,000,000,000(.00025)}{500(.0000004)} = \frac{16(25) \times 10^{9-5}}{5(4)10^{2-7}} = 20(10^{4-5}) = 2.0 \times 10^{10} =$$

7.
$$\frac{.01(35,000)(.000033)}{11,000,000(.0000015)} = \frac{1(35)(33)(10^{-2+3-6})}{11(15)(10^{6-7})} = 7(10^{-5-1}) = 7 \times 10^{-4}$$

$$9. \quad \frac{700(.000000006)}{.000021(30000)} = \frac{7(6)(10^{2-8})}{21(3)(10^{-6+4})} = \frac{2}{3}(10^{-6+2}) = .\overline{66}(10^{-4}) \approx 6.67 \times 10^{-5}$$

$$11. \quad \frac{36,000}{.003} = \frac{36(10^3)}{3(10^{-3})} = 12(10^{3-(-3)}) = 12(10^6) = 1.2 \times 10^7$$

$$13. \quad \frac{5}{-2^{-2}} = -\frac{5}{\frac{1}{4}} = -5(4) = 20 = 2.0 \times 10^1$$

$$15. \quad \frac{(.7)^2(2000)}{49,000(.005)} = \frac{(7 \cdot 10^{-1})^2(2)(10^3)}{49(5)(10^{3-3})} = \frac{49(2)(10^{-2+3})}{49(5)(10^0)} = \frac{2}{5}(10) = .4(10) = 4.0 \times 10^0$$

$$17. \quad \frac{358,103,204(.000000057)}{6,001,003(.003478)} = \frac{2.0411882(10^{10-8})}{2.088349044(10^{9-6})} = .009774172(10^{2-3}) \approx 9.77 \times 10^{-4}$$