Chapter 1

3. Express each of the following numbers in scientific notation:
   a. 8,400
   b. 99,000
   c. 0.2×10^6

3.a) 8.4×10^3

3.b) 9.9×10^4

3.c) 2.0×10^5

21. Divide the following numbers and express each result in engineering notation:

   a. $50 \div (2.2 \times 10^3)$

   b. $(5 \times 10^3) \div (25 \times 10^{-6})$

   c. $560 \times 10^3 \div (660 \times 10^3)$

21.a)

$$\frac{2.2 * 10^3}{5 * 10^1} = 0.44 * 10^2 = 44 * 10^0$$

21.b)

$$\frac{5 * 10^3}{25 * 10^{-6}} = \frac{1}{5} * 10^3 * 10^6 = 500 * 10^6$$

10^6 was chosen for easy word conversion to Mega

21.c)

$$\frac{560 * 10^3}{660 * 10^3} = \frac{56}{66} = 848.484 * 10^{-3}$$

10^{-3} was chosen for easy word conversion to mini.

31. Add the following quantities:
   a. $50 \text{ mA} + 680 \text{ } \mu A$
   b. $120 \text{ k}\Omega + 2.2 \text{ M}\Omega$
   c. $0.02 \text{ } \mu F + 3,300 \text{ pF}$

31.a)

$50*10^{-3} + 680*10^{-6}$

$50 * \dfrac{10^3}{10^3} * 10^{-3} + 680 * 10^{-6}$

$50000*10^{-6} + 680*10^{-6}$

$50680*10^{-6}$

$50.68 *10^{-3}$ A

50.68 mA

31.b)

$120*10^3 + 2.2*10^6$

$120*10^3 + 2.2*10^3 *10^3$

$120*10^3 + 2200*10^3$

$2320*10^3$

$2.32*10^6$ MΩ

31.c)

$0.02*10^{-6} + 3300*10^{-12}$

$0.02*10^{-6} + 3300*10^{-6}*10^{-6}$

$0.02*10^{-6} + 0.0033*10^{-6}$

$0.0233*10^{-6}$

$2.33*10^{3}*10^{-6}$

$23.3*10^{-3}$

23.3 mF