REVIEW QUESTIONS
Chapter 2

1. Determine the number of significant digits in each of the following numbers:

   a) 503 **3** b) 63,000 **2**

   c) 0.0051 **2** d) 0.03002 **4**

   e) 4.100 **4** f) 0.0810 **3**

2. Round each of the following numbers to 2 significant figures:

   a) 93.643 **94** b) 0.02857 **0.029**

   c) 12153 **12000** d) 158.35 **160**

3. Perform the following operations with the correct number of significant digits:

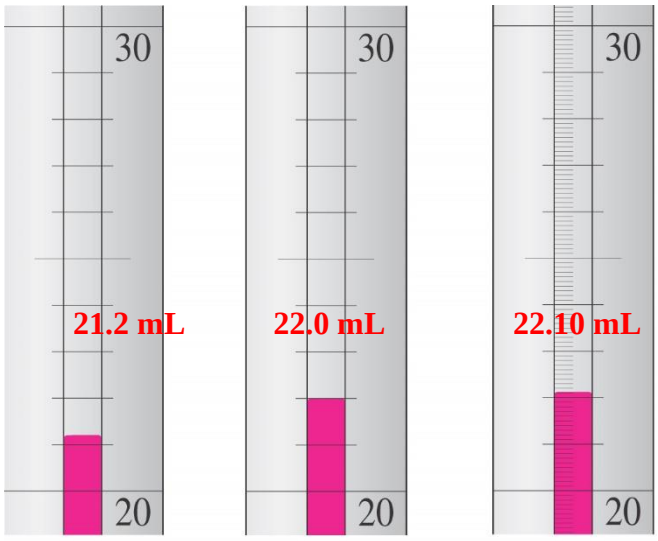
   a) (0.0394)(12.85) = **0.0506** **(3 sig figs)**

   b) $\frac{42.7853}{29.6}$ = **1.45** **(3 sig figs)**

   c) 12.62 + 1.5 + 0.25 = **14.4** **(1 decimal)**

   d) $\frac{284 x 0.293}{45}$ = **1.8** **(2 sig figs)**

4. Record each of the following measurements to the correct number of digits:



5. Convert each of the following units:

a) 1.78 kg to μg

$$1.78\ \text{kg} \times \frac{10^3\ \text{g}}{1\ \text{kg}} \times \frac{10^6\ \mu\text{g}}{1\ \text{g}} = 1.78\times10^9\ \mu\text{g}$$

b) 0.85 g to mg

$$0.85\ \text{g} \times \frac{10^3\ \text{mg}}{1\ \text{g}} = 850\ \text{mg}$$

c) 1.65 lbs to g (1 lb = 454 g)

$$1.65\ \text{lb} \times \frac{454\ \text{g}}{1\ \text{lb}} = 749\ \text{g}$$

d) 65 °C to K

$$65\ ^{\circ}\text{C} + 273 = 338\ \text{K}$$

e) 425 F to °C

$$(425-32) \div 1.8 = 218\ ^{\circ}\text{C}$$

6. A 13.5 mL sample of an unknown liquid has a mass of 12.4 g. What is the density of the liquid?

$$d = \frac{m}{V} = \frac{12.4\,g}{13.5\,mL} = 0.919\,g/mL \qquad (3\ sig\ figs)$$

7. The density of ether is 0.714 g/mL. What is the mass of 1.45 L of ether?

$$1.45\,L \times \frac{10^3\,mL}{1\,L} \times \frac{0.714\,g}{1\,mL} = 1040\,g \quad or \quad 1.04\,kg$$

8. What is the capacity of a gasoline container (in gal) if it contains 117 lb of gasoline with a density of 0.60 g/mL? (1lb=454 g; 1 gal=3.78 L)

$$117\ lb \times \frac{454\ g}{1\ lb} \times \frac{1\ mL}{0.60\ g} \times \frac{1\ L}{10^3\ mL} \times \frac{1\ gal}{3.78\ L} = 23\ gal \qquad (2\ sig\ figs)$$

9. A car travels at 55 miles per hour and gets 11 km/L of gasoline. How many gallons of gasoline are needed for a 3.0-hour trip? (1 mi=1.609 km; 1 gal=3.78 L)

$$3\ hr \times \frac{55\ mi}{1\ hr} \times \frac{1.609\ km}{1\ mi} \times \frac{1\ L}{11\ km} \times \frac{1\ gal}{3.78\ L} = 6.4\ gal \qquad (2\ sig\ figs)$$

10. Sterling silver is 92.5% silver by mass with a density of 10.3 g/cm^3. If a cube of sterling silver has a volume of 27.0 cm^3, how many ounces of pure silver are present? (1 oz=28.4 g)

$$\mathbf{27.0\ cm^3\ sterling \times \frac{10.3\ g}{1\ cm^3} \times \frac{92.5\ g\ silver}{100\ g\ sterling} \times \frac{1\ oz}{28.4\ g} = 9.06\ oz \qquad (3\ sig\ figs)}$$

11. The following nutrition information is listed on a box of crackers:

Serving size: 0.5 oz (6 crackers)
Fat: 4 g per serving
Sodium: 140 mg per serving

a) If the box has a net weight of 8.0 oz, how many crackers are in a box?

$$\mathbf{8.0\ oz \times \frac{6\ crackers}{0.5\ oz} = 96\ crackers}$$

b) How many grams of sodium are used to prepare 50 boxes of crackers?

$$\mathbf{50\ boxes \times \frac{8.0\ oz}{1\ box} \times \frac{1\ serving}{0.5\ oz} \times \frac{140\ mg}{1\ serving} \times \frac{1\ g}{10^3\ mg} = 110\ g \qquad (2\ sig\ figs)}$$