Chapter 3 Review

1. State the number of significant digits in each of the following measurements.

a) 2.54 cm 3

b) 32.06 kg 4

c) 5400 m 2

d) 4.5×10^{-3} g 2

e) 0.02 km 1

f) 2006 s 4

2. Solve the following problems and give the answer to the correct number of significant digits.

a) 432.2 m + 24.04 m = 456.2 m

b) 324.54 cm – 25.6 cm = 298.9 cm

c) 28.9g + 300.25g + 2.945g = 332.1 g

d) 54m x 826m = 45,000 m^2

e) 82.3 m x 1.254 m = 103 m^2

f) $(1.2 \times 10^6 m)(3.25 \times 10^4 m) = 3.9 \times 10^{10} m^2$

g) $\frac{32.6 \text{ kg}}{125.4 \text{ L}} = 0.260$ kg/L

h) $\frac{4.24 \times 10^{-3} \text{kg}}{2.2 \times 10^{-4} \text{ L}} = 19$ kg/L

3. Express the following measurements in scientific notation. Include the correct number of significant digits.

a) 560 cm = 5.6×10^2

b) 0.0480 s = 4.80×10^{-2}

c) 43200 mm^2 = 4.32×10^4

d) 4,320,000 km = 4.32×10^6

e) 0.00065 g = 6.5×10^{-4}

f) 101.35 ml = 1.0135×10^2

4. Convert the following measurements into the designated unit. USE DIMENSIONAL ANALYSIS FOR FULL CREDIT.

a) 35 mm to m

$\frac{35 \text{ mm}}{1} \cdot \frac{1 \text{ m}}{10^3 \text{ mm}} = 35 \times 10^{-3} \text{ m} = 3.5 \times 10^{-2} \text{ m}$

b) 450 cm^2 to mm^2

$\frac{450 \text{ cm}^2}{1} \cdot \frac{10 \text{ mm}}{1 \text{ cm}} \cdot \frac{10 \text{ mm}}{1 \text{ cm}} = 450 \times 10^2 = 4.5 \times 10^4 \text{ mm}^2$

c) 250 km^3 to cm^3

$\frac{250 \text{ km}^3}{1} \cdot \frac{10^3 \text{ m}}{1 \text{ km}} \cdot \frac{10^3 \text{ m}}{1 \text{ km}} \cdot \frac{10^3 \text{ m}}{1 \text{ km}} \cdot \frac{10^2 \text{ cm}}{1 \text{ m}} \cdot \frac{10^2 \text{ cm}}{1 \text{ m}} \cdot \frac{10^2 \text{ cm}}{1 \text{ m}} = 250 \times 10^{15} = 2.5 \times 10^{17} \text{ cm}^3$

d) 1500 ng to g

$\frac{1500 \text{ ng}}{1} \cdot \frac{1 \text{ g}}{10^9 \text{ ng}} = 1500 \times 10^{-9} = 1.5 \times 10^{-6} \text{ g}$

e) 346ms to s $\frac{346 \text{ ms}}{1} \cdot \frac{1 \text{ s}}{10^3 \text{ ms}} = 346 \times 10^{-3} \text{ s} = 3.46 \times 10^{-1} \text{ s}$

f) 543 mg to kg $\frac{543 \text{ mg}}{1} \cdot \frac{1 \text{ g}}{10^3 \text{ mg}} \cdot \frac{1 \text{ kg}}{10^3 \text{ g}} = 543 \times 10^{-6} = 5.43 \times 10^{-4} \text{ kg}$

g) Convert gold's density 19.32 g/cm^3 to kg/m^3.

$\frac{19.32 \text{ g}}{1 \text{ cm}^3} \cdot \frac{1 \text{ kg}}{10^3 \text{ g}} \cdot \frac{10^2 \text{ cm}}{1 \text{ m}} \cdot \frac{10^2 \text{ cm}}{1 \text{ m}} \cdot \frac{10^2 \text{ cm}}{1 \text{ m}} = 19.32 \times 10^3 = 1.932 \times 10^4 \text{ kg/m}^3$