Name _____
Period ___ Date _____

Conversion Review Problems

Convert the following:

1) 101.376mm² to km²

$\frac{101.376\,mm^2}{1} \cdot \frac{1\,m}{10^3\,mm} \cdot \frac{1\,m}{10^3\,mm} \cdot \frac{1\,km}{10^3\,m} \cdot \frac{1\,km}{10^3\,m} = 101.376\times10^{-12} = 1.01376\times10^{-10}\,km^2$

2) 7.629×10^4 kg/m³ to g/cm³

$\frac{7.629\times10^4\,kg}{m^3} \cdot \frac{10^3\,g}{1\,kg} \cdot \frac{1\,m}{10^2\,cm} \cdot \frac{1\,m}{10^2\,cm} \cdot \frac{1\,m}{10^2\,cm} = 7.629\times10 = 76.29\,g/cm^3$

3) 13.6045×10^{-6} gcm/ms² to kgm/s²

$\frac{13.6045\times10^{-6}\,gcm}{ms^2} \cdot \frac{1\,kg}{10^3\,g} \cdot \frac{1\,m}{10^2\,cm} \cdot \frac{10^3\,ms}{1\,s} \cdot \frac{10^3\,ms}{1\,s} = 13.6045\times10^{-5} = 1.36045\times10^{-4}\,kgm/s^2$

4) 437.8L to m³ (1kl = 1m³)

$\frac{437.8\,L}{1} \cdot \frac{1\,kL}{10^3\,L} \cdot \frac{1\,m^3}{1\,kL} = 437.8\times10^{-3} = 4.378\times10^{-1}\,m^3$

5) Which is the longer wavelength, 7 x 10⁵nm or 4 x 10²μm?

$\frac{7\times10^5\,nm}{1} \cdot \frac{1\,m}{10^9\,nm} = 7\times10^{-4}\,m$ $\quad \frac{4\times10^2\,\mu m}{1} \cdot \frac{1\,m}{10^6\,\mu m} = 4\times10^{-4}$

6) What is the mass of a piece of iron, in kg, if its density is 7.8g/cm³ and its volume is .250m³?

$\frac{7.8\,g}{1\,cm^3} = \frac{x\,g}{.250\times10^6\,cm^3}$ $\quad x = 1.95\times10^6 = 2.0\times10^6\,g$

$V = .250\,m^3 \cdot \frac{10^2\,cm}{1\,m} \cdot \frac{10^2\,cm}{1\,m} \cdot \frac{10^2\,cm}{1\,m} = .250\times10^6\,cm^3$

7) How many sig figs in 300Mm? 1 0.00123400g? 6

8) What is the total mass of the following metal samples?
25g, 30.10g, 40.000g, 35.1g = 130.2g = 130. g or 1.30×10^2 g

9) What is the density of an object with a mass of 10.00g and a volume of 3.3cm³?

$\rho = \frac{m}{V} = \frac{10.00\,g}{3.3\,cm^3} = 3.0303\overline{03} = 3.0\,g/cm^3$

Name:_____

(9)

DIMENSIONAL ANALYSIS REVIEW PROBLEMS

*Convert the following measurements and write answer in correct scientific notation form.

1. 689 dm³ to km³

$\frac{689\,dm^3}{1} \cdot \frac{1\,m}{10\,dm} \cdot \frac{1\,m}{10\,dm} \cdot \frac{1\,m}{10\,dm} \cdot \frac{1\,km}{10^3\,m} \cdot \frac{1\,km}{10^3\,m} \cdot \frac{1\,km}{10^3\,m} = 689\times10^{-12} = 6.89\times10^{-10}\,km^3$

2. 45.69×10^4 g/cm³ to mg/mm³

$\frac{45.69\times10^4\,g}{1\,cm^3} \cdot \frac{10^3\,mg}{1\,g} \cdot \frac{1\,cm}{10\,mm} \cdot \frac{1\,cm}{10\,mm} \cdot \frac{1\,cm}{10\,mm} = 45.69\times10^4 = 4.569\times10^{1}$ mg/mm³

3. 3.45×10^{-5} mgcm/ms² to kgm/s²

$\frac{3.45\times10^{-5}\,mgcm}{ms^2} \cdot \frac{1\,g}{10^3\,mg} \cdot \frac{1\,kg}{10^3\,g} \cdot \frac{1\,m}{10^2\,cm} \cdot \frac{10^3\,ms}{1\,s} \cdot \frac{10^3\,ms}{1\,s} = 3.45\times10^{-5}\times10^{-2} = 3.45\times10^{-7}\,kgm/s^2$

4. 9m³ to mL 1 kL = 1 m³

$\frac{9\,m^3}{1} \cdot \frac{1\,kL}{1\,m^3} \cdot \frac{10^3\,L}{1\,kL} \cdot \frac{10^3\,mL}{1\,L} = 9\times10^6\,mL$

5. Which is more massive, 4.5×10^3 μg or 2×10^5 ng? Convert both to grams.

$\frac{4.5\times10^3\,\mu g}{1} \cdot \frac{1\,g}{10^6\,\mu g} = 4.5\times10^{-3}\,g$ $\quad \frac{2\times10^5\,ng}{1} \cdot \frac{1\,g}{10^9\,ng} = 2\times10^{-4}\,g$

6. Find the volume of a piece of lead, in m³, if its density is 11.3×10^3 kg/m³ and its mass is 56.75g.

$\frac{11.3\times10^3\,kg}{1\,m^3} = \frac{56.75\times10^{-3}\,kg}{V\,m^3} \Rightarrow 11.3\times10^3\,V = 56.75\times10^{-3}$

$V = 5.02\times10^{-6}\,m^3$

7. How many seconds in 5 months and 9 days? (1 month = 30 days)

$\frac{159\,days}{1} \cdot \frac{24\,hr}{1\,day} \cdot \frac{60\,min}{1\,hr} \cdot \frac{60\,sec}{1\,min} = 1.37376\times10^7\,sec$