Name KEY Date:_____ Hour: _____

Dimensional Analysis Extra Review Problems #1

Conversion Factors: 1mile = 1.609 km 1 mile = 5280 feet 1 inch = 2.54 cm
454 g = lb 1 kg = 2.2 lb

1. Convert 26.4 mi to km

$\frac{26.4\text{ mi}}{1} \times \frac{1.609\text{ Km}}{1\text{ mi}} = 42.5\text{ Km}$ $4.2 \times 10^{1}\text{ Km}$

2. Convert 0.0489 g to mg

$\frac{0.0489\text{ g}}{1} \times \frac{1000\text{ mg}}{1\text{ g}} = 48.9\text{ mg}$ $4.89 \times 10^{1}\text{ mg}$

3. Convert 16 years to days

$\frac{16\text{ yrs}}{1} \times \frac{365\text{ days}}{1\text{ yr}} = 5840\text{ days}$ $5.84 \times 10^{3}\text{ days}$

4. Convert 1067 cm to km

$\frac{1067\text{ cm}}{1} \times \frac{1\text{ m}}{100\text{ cm}} \times \frac{1\text{ Km}}{1000\text{ m}} = 0.01067\text{ Km}$ $1.067 \times 10^{-2}\text{ Km}$

5. How many feet are in 3.2 miles?

$\frac{3.2\text{ mi}}{1} \times \frac{5280\text{ ft}}{1\text{ mi}} = 16,896\text{ ft}$ $1.69 \times 10^{4}\text{ ft}$

6. How many miles is 7,598 feet?

$\frac{7598\text{ ft}}{1} \times \frac{1\text{ mi}}{5280\text{ ft}} = 1.44\text{ mi}$ $1.44 \times 10^{0}\text{ mi}$

7. How many meters are in 2.7 km?

$\frac{2.7\text{ Km}}{1} \times \frac{1000\text{ m}}{1\text{ Km}} = 2700\text{ m}$ $2.700 \times 10^{3}\text{ m}$

8. How many inches are in 1 mile?

$\frac{1\text{ mi}}{1} \times \frac{5280\text{ ft}}{1\text{ mi}} \times \frac{12\text{ in}}{1\text{ ft}} = 63,360\text{ in}$ $6.34 \times 10^{4}\text{ in}$

9. How many mm are in 0.001 km?

$\frac{.001\text{ Km}}{1} \times \frac{1000\text{ M}}{1\text{ Km}} \times \frac{1000\text{ mm}}{1\text{ m}} = 1000\text{ mm}$ $1 \times 10^{3}\text{ mm}$

10. How many km/hr is 30 m/s?

$\frac{30\text{ m}}{s} \times \frac{1\text{ Km}}{1000\text{ m}} \times \frac{60\text{ s}}{1\text{ min}} \times \frac{60\text{ min}}{1\text{ hr}} = 108\ \frac{\text{Km}}{\text{hr}}$ $1.08 \times 10^{2}\ \frac{\text{Km}}{\text{hr}}$

11. How many ft/s is 60 mi/hr?

$\frac{60\text{ mi}}{\text{hr}} \times \frac{5280\text{ ft}}{1\text{ mi}} \times \frac{1\text{ hr}}{60\text{ min}} \times \frac{1\text{ min}}{60\text{ sec}} = 88\ \frac{\text{ft}}{\text{s}}$

12. How many miles/hour is 30 km/s?

$$\frac{30\,km}{s} \times \frac{1\,mi}{1.609\,km} \times \frac{60\,s}{1\,min} \times \frac{60\,min}{1\,hr} = 6.71 \times 10^{4}\ mi/hr$$

13. Imagine that water is leaking from a container, at a rate of 1.2 ml/hour. If this rate does not change, how many liters of water will be lost in a week?

$$\frac{1.2\,mL}{hr} \qquad \frac{1\,wk}{1} \times \frac{7\,days}{1\,wk} \times \frac{24\,hr}{1\,day} \times \frac{1.2\,mL}{1\,hr} \times \frac{1\,L}{1000\,mL} = 0.202\,L$$

$2.02 \times 10^{-1}\,L$

14. Change 2.6 km/day to m/week

$$\frac{2.6\,km}{day} \times \frac{1000\,m}{1\,km} \times \frac{7\,days}{1\,wk} = 18{,}200\ m/wk \qquad 1.82 \times 10^{4}\ m/wk$$

15. Change 60 yds/ hours to inches/ seconds

$$\frac{60\,yds}{hr} \times \frac{3\,ft}{1\,yd} \times \frac{12\,in}{1\,ft} \times \frac{1\,hr}{60\,min} \times \frac{1\,min}{60\,sec} = 0.6\ in/sec.$$

16. Convert 1.7 Kg to cg

$$\frac{1.7\,kg}{1} \times \frac{1000\,g}{1\,kg} \times \frac{100\,cg}{1\,g} = 1.7 \times 10^{5}\ cg$$

17. Convert 19.545 cg to kg

$$\frac{19.545\,cg}{1} \times \frac{1\,g}{100\,cg} \times \frac{1\,kg}{1000\,g} = 1.95 \times 10^{-4}\ kg$$

18. Calculate the height of a 5 foot 10 inch man in m, mm, and cm.

$$\frac{70\,in}{1} \times \frac{2.54\,cm}{1\,in} = \boxed{177.8\,cm}$$

$$\times \frac{1\,m}{100\,cm} = \boxed{1.778\,m} \times \frac{1000\,mm}{1\,m} = \boxed{1778\,mm}$$

19. Calculate the number of kg, g, and mg in 1/4 lb of margarine

$$\frac{.25\,lb}{1} \times \frac{453.6\,g}{1\,lb} = \boxed{113.4\,g} \times \frac{1\,kg}{1000\,g} = \boxed{0.1134\,kg}$$

$$\times \frac{1000\,mg}{1\,g} = \boxed{1.134 \times 10^{5}\,mg}$$

20. Change 550 grams to kg, mg. and lb

$$\frac{550\,g}{1} \times \frac{1\,kg}{1000\,g} = \boxed{.55\,kg} \qquad \frac{550\,g}{1} \times \frac{1000\,mg}{1\,g} = \boxed{5.5 \times 10^{5}\,mg}$$

$$\frac{550\,g}{1} \times \frac{1\,lb}{453.6\,g} = \boxed{1.2\,lb}$$