

Dimensional Analysis Worksheet

Show your work including cancelling all units.

Part I-

1) How many inches are there in a mile? (5280 feet long)

$$\frac{\text{miles}}{\text{feet}} \times \frac{\text{feet}}{\text{inches}} = \boxed{}$$

2) How many seconds are in a year?

$$\frac{\text{years}}{\text{days}} \times \frac{\text{days}}{\text{hours}} \times \frac{\text{hours}}{\text{minutes}} \times \frac{\text{minutes}}{\text{seconds}} = \boxed{}$$

3) How many meters are in a light-year if the speed of light is 300,000,000 m/sec.

$$\frac{\text{light-years}}{\text{meters}} \times \frac{\text{meters}}{\text{seconds}} \times \frac{\text{seconds}}{\text{minutes}} \times \frac{\text{minutes}}{\text{hours}} \times \frac{\text{hours}}{\text{days}} \times \frac{\text{days}}{\text{years}} = \boxed{}$$

4) An adult mosquito's lifespan is about 16 days. How many minutes is that?

$$\frac{\text{days}}{\text{hours}} \times \frac{\text{hours}}{\text{minutes}} = \boxed{}$$

5) How many years of your life will you be sleep if you live 3.95×10^7 minutes and average 8 hours sleep/night.

$$\frac{\text{minutes}}{\text{hours}} \times \frac{\text{hours}}{\text{days}} \times \frac{\text{days}}{\text{years}} = \boxed{}$$

6) How many atoms are in a kilogram of silver, if there are 6.02×10^{23} atoms per mole and silver weighs 107.9 grams/mole?

$$\frac{\text{kilograms}}{\text{grams}} \times \frac{\text{grams}}{\text{mole}} \times \frac{\text{atoms}}{\text{mole}} = \boxed{}$$

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8) If there are three teaspoons in a tablespoon, 16 tablespoons in a cup, 2 cups in a pint, and 8 pints in a gallon. How many tablespoons are in a 1000-gallon swimming pool?

$$\frac{\quad}{\quad} \times \frac{\quad}{\quad} \times \frac{\quad}{\quad} \times \frac{\quad}{\quad} = \boxed{\quad}$$

9) Aroldis Chapman of the Cincinnati Reds can throw a fastball at 101 mph. The mound is 60 feet from home plate, how long will it take a wild pitch to hit the batter?

$$\frac{\quad}{\quad} \times \frac{\quad}{\quad} \times \frac{\quad}{\quad} \times \frac{\quad}{\quad} = \boxed{\quad}$$

11) If the density of gold is 19.30 g/ml and I have a gold bar with the dimensions of 65mm x 32mm x 14mm. One milliliter has the dimensions of 1 cm³

$$\frac{\quad}{\quad} \times \frac{\quad}{\quad} \times \frac{\quad}{\quad} \times \frac{\quad}{\quad} = \boxed{\quad}$$

12) The conversion from Fahrenheit to Celsius is $1.8^{\circ}\text{C} + 32 = ^{\circ}\text{F}$.

a) Convert 37°C to °F =

b) Convert 212°F to °C =

c) Convert -40°C to °F =

d) Convert -273°C to °F =

e) Convert 32°F to °C =



13) A cheetah can run up to 70 mph. How long will it take to catch an antelope running 45 mph, if the antelope has a 50 yard head start?