

For each of the following problems use dimensional analysis (factor - label) to write equations. Show all units but do not calculate a final answer.

- 1) How many dimes have the same value as 17 loonies? (1)

$$17 \cancel{\text{loonies}} \times \frac{10 \text{ DIMES}}{1 \cancel{\text{loonie}}} = 170 \text{ dimes.}$$

- 2) How many cm are there in 15.6 m? (1)

$$15.6 \cancel{\text{ m}} \times \frac{100 \text{ cm}}{1 \cancel{\text{ m}}} = 156 \text{ cm.}$$

- 3) How many minutes are there in 154.7 seconds? (1)

$$154.7 \cancel{\text{ s}} \times \frac{1 \text{ min}}{60 \cancel{\text{ s}}} = 2.578 \text{ min}$$

- 4) If your heart beats an average of 69 times per minute, how many beats would your heart make in a life that lasted 82 years? (2)

$$82 \cancel{\text{ years}} \times \frac{365 \cancel{\text{ days}}}{1 \cancel{\text{ yr}}} \times \frac{24 \cancel{\text{ hours}}}{1 \cancel{\text{ days}}} \times \frac{60 \cancel{\text{ min's}}}{1 \cancel{\text{ hours}}} \times \frac{69 \cancel{\text{ beats}}}{1 \cancel{\text{ min}}}$$

$$= \quad \times 10^9 \text{ beats.}$$

- 5) A very large diamond has a volume of 39 mL. If the density of diamond is 3.51g per mL and 1 carat equals 0.200 g, how many carats is this diamond?

$$39 \cancel{\text{ mL}} \times \frac{3.51 \cancel{\text{ g}}}{1 \cancel{\text{ mL}}} \times \frac{1 \cancel{\text{ carat}}}{0.200 \cancel{\text{ g}}} = 684.45 \text{ carats}$$

$$\text{sig figs} = 680 \text{ carats}$$

$$\text{OR}$$

$$6.8 \times 10^2 \text{ carats.}$$