

REVIEW FOR QUIZ

NAME: _____

Solve the following using the Factor-Label Method. Show all work and all units.

1) 45 Tm = ? miles

ANSWER: *two sig figs*

$$\frac{45 \text{ Tm}}{1 \text{ Tm}} \times \frac{10^{14} \text{ cm}}{2.54 \text{ cm}} \times \frac{1 \text{ in}}{12 \text{ in}} \times \frac{1 \text{ ft}}{5280 \text{ ft}} \times \frac{1 \text{ mile}}{1 \text{ mile}} = 2.8 \times 10^{10} \text{ miles}$$

2) $5.25 \times 10^5 \text{ mL} = ? \text{ gallons}$ **ANSWER:** *three sig figs*

$$\frac{5.25 \times 10^5 \text{ mL}}{10^3 \text{ mL}} \times \frac{1 \text{ L}}{3.785 \text{ L}} \times \frac{1 \text{ gallon}}{1 \text{ gallon}} = 139 \text{ gallons}$$

3) $254 \text{ lbs} / \text{in}^2 = ? \text{ kg} / \text{cm}^2$ **ANSWER:** *three sig figs*

$$\frac{254 \text{ lbs}}{\text{in}^2} \times \frac{454 \text{ g}}{1 \text{ lbs}} \times \frac{1 \text{ kg}}{10^3 \text{ g}} \times \frac{(1)^2 (\text{in})^2}{(2.54)^2 (\text{cm})^2} = 17.9 \frac{\text{kg}}{\text{cm}^2}$$

4) $4.77 \times 10^{-5} \text{ Gg} = ? \text{ lbs}$ **ANSWER:** *three sig figs*

$$\frac{4.77 \times 10^{-5} \text{ Gg}}{1 \text{ Gg}} \times \frac{10^9 \text{ g}}{454 \text{ g}} \times \frac{1 \text{ lbs}}{1 \text{ lbs}} = 105 \text{ lbs}$$

5) $8.55 \times 10^8 \text{ pg} / \text{in}^3 = ? \text{ kg} / \text{mm}^3$

ANSWER: *three sig figs*

$$\frac{8.55 \times 10^8 \text{ pg}}{\text{in}^3} \times \frac{1 \text{ kg}}{10^{15} \text{ pg}} \times \frac{(1)^3 (\text{in})^3}{(2.54)^3 (\text{cm})^3} \times \frac{(1)^3 (\text{cm})^3}{(10^1)^3 (\text{mm})^3} = 5.22 \times 10^{-11} \frac{\text{kg}}{\text{mm}^3}$$

6) Calculate the volume of an object that has a density of $6.45 \text{ g} / \text{cm}^3$ with a mass of 688 grams.

ANSWER: *three sig figs*

$$D = \frac{m}{V} ; V = \frac{m}{D} ; V = \frac{688 \text{ g}}{6.45 \frac{\text{g}}{\text{cm}^3}} = \frac{688 \text{ g} (\text{cm}^3)}{6.45 \text{ g}} = 107 \text{ cm}^3$$

7) Calculate the mass of an object that has a density of $19.2 \text{ g} / \text{cm}^3$ with a volume of 67 cm^3 .

ANSWER: *two sig figs*

$$D = \frac{m}{V} ; m = DV ; m = \left(19.2 \frac{\text{g}}{\text{cm}^3} \right) (67 \text{ cm}^3) = 1.3 \times 10^3 \text{ g}$$

8) Calculate the density of an object that has a volume of 354 cm^3 with a mass of 788 grams.

ANSWER: *three sig figs*

$$D = \frac{m}{V} ; D = \frac{788 \text{ g}}{354 \text{ cm}^3} = 2.23 \frac{\text{g}}{\text{cm}^3}$$

- 9) An experiment performed to determine the density of gold yields a value of 18.4 g/cm^3 . The literature value for the density of gold is 19.2 g/cm^3 . Calculate the percent error.

ANSWER: *three sig figs*

$$\% \text{ Error} = \frac{| \text{lab value} - \text{true value} |}{\text{true value}} \times 100$$

$$\frac{| 18.4 \frac{\text{g}}{\text{cm}^3} - 19.2 \frac{\text{g}}{\text{cm}^3} |}{19.2 \frac{\text{g}}{\text{cm}^3}} \times 100 = 4.17\%$$