

Show All Work To Receive Credit! Conversion factors and prefixes:

G = 10^9 , M = 10^6 , k = 10^3 , c = 10^{-2} , m = 10^{-3} , μ = 10^{-6} , n = 10^{-9} , p = 10^{-12} , 2.54 cm = 1 in,
 12 in = 1 ft, 5280 ft = 1 mile, 3 feet = 1 yd, 60 sec = 1 min, 1 hr = 60 min, 4 quarts = 1 gal, 2 pints = 1 quart

1. (6 Pts) Perform each of the following conversions. You must show the complete setup.

a. Convert 88 mg to pg.

$$\frac{88 \text{ mg}}{\cancel{\text{m}}} \left| \frac{10^{-3}}{\cancel{\text{g}}} \right| \left| \frac{\text{p}}{10^{-12}} \right| = \underline{\underline{88 \times 10^9}} \text{ or } \underline{\underline{8.8 \times 10^{10} \text{ pg}}}$$

b. Convert 85 μ L to nL.

$$\frac{85 \text{ }\mu\text{L}}{\cancel{\mu}} \left| \frac{10^{-6}}{\cancel{\text{L}}} \right| \left| \frac{\text{n}}{10^{-9}} \right| = \underline{\underline{85 \times 10^3}} \text{ or } \underline{\underline{8.5 \times 10^4 \text{ nL}}}$$

2. (4 Pts) Assume each of following numbers are measurements. Perform the indicated operations and then report the answer with the proper number of significant figures.

a. $12.145 \text{ cm} + 15.1265 \text{ cm} + 25.2 \text{ cm} = \underline{52.4715} \Rightarrow \underline{\underline{52.5}} \text{ cm}$
 ↳ one tenth place

b. $10.25 \text{ cm} \times 12.10 \text{ cm} \times 10.145 \text{ cm} = \underline{1258} \text{ cm}^3$
 ↳ 4 s. figs

3. (5 Pts) A poster measures 22 cm by 44 cm. Determine its area in square inches (inches²) (you may ignore significant figures).

$A = l \times w$

$$\frac{44 \text{ cm}}{\cancel{2.54 \text{ cm}}} \left| \frac{1 \text{ in}}{\cancel{2.54 \text{ cm}}} \right| \left| \frac{22 \text{ cm}}{\cancel{2.54 \text{ cm}}} \right| \left| \frac{1 \text{ in}}{\cancel{2.54 \text{ cm}}} \right| = \underline{\underline{150. \text{ in}^2}}$$

4. (5 Pts) How many mega-inches are in 7 miles (You may ignore significant figures)?

$$\frac{7 \text{ mi}}{\cancel{1 \text{ mi}}} \left| \frac{5280 \text{ ft}}{\cancel{1 \text{ ft}}} \right| \left| \frac{12 \text{ in}}{\cancel{1 \text{ ft}}} \right| \left| \frac{\text{M}}{10^6} \right| = \underline{\underline{0.44352 \text{ M in}}}$$

5. (5 Pts) A sample of silver ore was found to contain 0.35 % silver by mass. How many mg of silver can be recovered 900.0 Mg of ore?

$$\frac{900.0 \text{ Mg ore}}{\cancel{\text{M}}} \left| \frac{10^6}{\cancel{\text{M}}} \right| \left| \frac{0.35 \text{ Ag}}{100 \text{ ore}} \right| \left| \frac{\text{m}}{10^{-3}} \right| = \underline{\underline{3.15 \times 10^9 \text{ mg Ag}}}$$

Show All Work To Receive Credit! Conversion factors and prefixes:

G = 10⁹, M = 10⁶, k = 10³, c = 10⁻², m = 10⁻³, μ = 10⁻⁶, n = 10⁻⁹, p = 10⁻¹², 2.54 cm = 1 in, 12 in = 1 ft, 5280 ft = 1 mile, 3 feet = 1 yd, 60 sec = 1 min, 1 hr = 60 min, 4 quarts = 1 gal, 2 pints = 1 quart

1. (6 Pts) Perform each of the following conversions. You must show the complete setup.

a. Convert 327 pL to mL.

$$\frac{327 \cancel{\text{pL}}}{\cancel{\text{p}}} \left| \frac{10^{-12}}{\cancel{\text{L}}} \right| \frac{\text{m}}{10^{-3}} = \underline{327 \times 10^{-9}} \text{ or } \underline{3.27 \times 10^{-7} \text{ mL}}$$

b. Convert 805 μg to cg.

$$\frac{805 \cancel{\mu\text{g}}}{\cancel{\mu}} \left| \frac{10^{-6}}{\cancel{\text{g}}} \right| \frac{\text{c}}{10^{-2}} = \underline{805 \times 10^{-4}} \text{ or } \underline{8.05 \times 10^{-2} \text{ cg}}$$

2. (4 Pts) Assume each of following numbers are measurements. Perform the indicated operations and then report the answer with the proper number of significant figures.

a. 13.1 cm + 12.526 cm + 0.052 cm = 25.678 = 25.7 cm
 ↳ one tenth place

b. 1.212 cm x 6.12 cm x 12.145 cm = 90.08 = 90.1 cm³
 ↳ 3 sig figs

3. (5 Pts) A poster measures 33 cm by 45 cm. Determine its area in square inches (inches²). (You may ignore significant figures)

A = l · w

$$\frac{33 \cancel{\text{cm}}}{2.54 \cancel{\text{cm}}} \left| \frac{\text{in}}{\cancel{\text{cm}}} \right| \frac{45 \cancel{\text{cm}}}{2.54 \cancel{\text{cm}}} \left| \frac{\text{in}}{\cancel{\text{cm}}} \right| = \underline{230 \text{ in}^2}$$

4. (5 Pts) How many Mega-inches are in 0.5 kilo-miles (You may ignore significant figures)?

$$\frac{0.5 \cancel{\text{km}}}{\cancel{\text{k}}} \left| \frac{10^3}{\cancel{\text{m}}} \right| \frac{5280 \cancel{\text{ft}}}{\cancel{\text{mi}}} \left| \frac{12 \cancel{\text{in}}}{\cancel{\text{ft}}} \right| \frac{\text{M}}{10^6} = \underline{31.68 \text{ M in}}$$

5. (5 Pts) A sample of silver ore was found to contain 0.56 % silver by mass. How many mg of silver can be recovered 500.0 Mg of ore?

$$\frac{500.0 \cancel{\text{Mg ore}}}{\cancel{\text{M}}} \left| \frac{10^6}{\cancel{\text{g}}} \right| \frac{0.56 \text{ Ag}}{100 \text{ ore}} \left| \frac{\text{m}}{10^{-3}} \right| = \underline{2.8 \times 10^9 \text{ mg Ag}}$$