

Be sure to show all work, use the correct number of significant figures, circle final answers and use correct units in all problems.
ANSWERS appear in BOLD

1. A bar of gold (density = 19.3 g/cm^3) has a volume of 8.0 qt. What is the mass of the gold in pounds? (1 L = 1.06 qt; 454 g = 1 lb). (5 points)

$$8.0 \text{ qt} * (\text{L} / 1.06 \text{ qt}) * (10^3 \text{ mL/L}) * (\text{cm}^3/\text{mL}) * 19.3 \text{ g/cm}^3 * (\text{lb}/454 \text{ g}) = 3.2 * 10^2 \text{ lb}$$

2. North Dakota has a population of 749,000 and occupies 70,665 square miles (miles²). If one acre is 43,560 square feet (ft²), what is the acreage per resident? (1 mile = 5280 feet) (5 points)

$$(70,665 \text{ mi}^2 / 749,000 \text{ people}) * (5280 \text{ ft/mi}) * (5280 \text{ ft/mi}) * (1 \text{ acre} / 43,560 \text{ ft}^2) = 60.4 \text{ acres/person}$$

3. Perform the following calculations. Report the answer to the correct number of significant digits. (5 points)

$$17.89 \text{ cm} + 0.232 \text{ cm} + 32.2 \text{ cm} \quad \underline{\mathbf{50.3 \text{ cm}}}$$

$$\frac{(2.34 \times 10^3 \text{ cm})(4.2021 \times 10^{-6} \text{ cm})}{(8.7 \times 10^3 \text{ s})} \quad \underline{\mathbf{1.1 * 10^{-6} \text{ cm}^2/\text{s}}}$$

$$54.721 = 2.9 \times Q \quad Q = \underline{\mathbf{19}}$$

4. Convert the following quantities: (5 points) Watch sig figs!

$$93 \text{ K to } ^\circ\text{C. } 93 - 273 = \mathbf{-180. } ^\circ\text{C}$$

$$1.17 \text{ g/cm}^3 \text{ to } \text{g/mm}^3 \quad 1.17 \text{ g/cm}^3 * (1 \text{ cm} / 10 \text{ mm})^3 = \mathbf{1.17 * 10^{-3} \text{ g/mm}^3}$$

$$7.360 \text{ g to kg} \quad 7.360 \text{ g} * (1 \text{ kg} / 1000 \text{ g}) = \mathbf{7.360 * 10^{-3} \text{ kg}}$$