Full Name: February 15, 2023

MATH SKILLS

0.1 Solve for x in the following algebraic equations: (a) $3x + 1 = 5$ (b) $2x - 1 = 5$ (c) $\frac{3}{2} = \frac{1}{2x}$

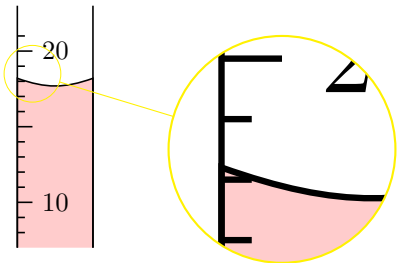
0.2 Compute the following calculations involving scientific notation: (a) $\frac{2.4\times10^{-3}}{5\cdot4.6\times10^{-6}}$ (b) $\frac{1}{3\cdot4\times10^{-1}}$ (c) $\frac{1}{4\cdot1\times10^{-4}}$

UNITS OF MEASUREMENTS AND SYSTEMS OF UNITS

0.3 Indicate the magnitude measured in the following measurements: (a) 100 Kg (b) 10h

SIGNIFICANT FIGURES

0.4 Give the following measurement in mL with the correct number of digits, while indicating the number of significant figures of the measurement and the estimated digit.



0.5 Carry the following calculations with the correct number of digits or significant figures:

(a) 523×5000

(b) $5/0.123$

(c) 27.0×0.01

(d) $345.13/100$

0.6 Which of the following measurents contains the designated CORRECT number of significant figures? (a) 0.05600 cm (5 SF) (b) 0.0304 cm (3 SF) (c) 456 000 cm (3 SF) (d) 1.304 cm (2 SF) (e) 3.12050 cm (4 SF)

0.7 Round the following numbers to 1SFs: (a) 12849m (b) 5111s (c) 2.4566×10^{-3}Kg (d) 0.051376cm (e) 573456mm (f) 0.0293845μm

PREFIXES & CONVERSION FACTORS

0.8 Fill the gap in the following unit equalities or conversion factors: $\frac{1fs}{\quad s}$

Using Conversion Factors

0.9 Complete the following unit conversion:

$$50\cancel{km} \times \frac{\quad m}{\quad \cancel{km}} = \quad m$$

0.10 Fill the gap in the following conversion factors:

$$5\cancel{nm} \times \frac{1 \times 10^{-3} m}{1\cancel{nm}} \times \frac{1nm}{1 \times 10^{-9}\cancel{m}} = \quad nm$$

0.11 Fill the gap in the following conversion factors:

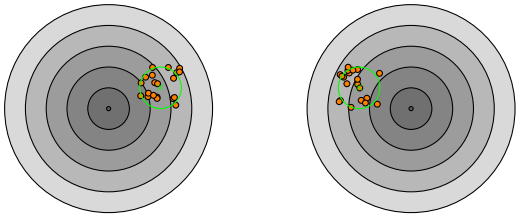
$$20\cancel{cm} \times \frac{\quad}{\quad} = 7.87in$$

0.12 Set up the following conversion factor:

$$0.4\cancel{m^3} \times \frac{\quad}{\quad} = \quad m^3$$

Measurements and uncertainty

0.13 Compare the precision and accuracy of the following measurements:



Matter

0.14 Classify the following objects as an element, compound, and homogeneous mixture, a heterogeneous mixture or none of the others: (a) a copper wire (b) a chocolate cookie (c) a chocolate-chip cookie (d) vinegar (e) ice (f) baking soda (g) aluminum foil (h) vitamin C

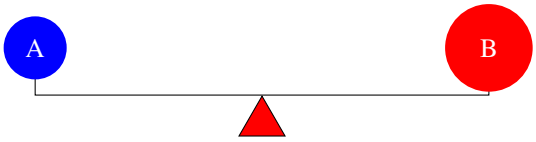
0.15 Which of the following is a property of a gas and a liquid? (a) It flows. (b) It takes the shape of the container. (c) It has no shape. (d) It fills the volume of the container. (e) The particles move slowly. (f) The interactions between its particles are strong. (g) The particles move at a rapid rate. (h) The interactions between its particles are unesxistent. (i) The particles have fixed positions and are very close together.

Density

0.16 Determine the density (g/mL) of a 0.05 L sample of a salt solution that has a mass of 10 g.

0.17 You have a large water tank used as a cooler in a party and you have a bunch of cans: a coke can, a diet coke can, a water can and a schweppes can. You add all unopened cans on the tank. Describe the final vertical distribution of cans in the tank. Which can will stay on top and which will sink in more?

0.18 Which of the circles is more dense: A or B.



0.19 Answer the following questions involving specific gravity: (a) True or false: an olive oil sample should have a specific gravity larger than one. (b) A sample has a mass of 5mg and a specific gravity of 0.87. Calculate its volume in mL.

0.20 Answer the following questions involving dosages: (a) A patient requires 1g of medication given every three hours. The medication in stock was found in tablets of 200mg. How many tablets do you need in three days? (b) A medication needs to be given based on the patient's body weight as 2mg/Kg. If a patient weighs 70Kg and the mediation stock is 100mg/mL, how many mL are needed?