

Key

Review Unit 2

1. Rewrite the following in scientific notation.

- a. 433 4.33×10^2
 b. 1,110,000,000 1.11×10^9
 c. 0.0202 2.02×10^{-2}
 d. 0.000104 1.04×10^{-4}

2. How many sig figs are in each of the numbers in question #1?

a. (3) b. (3) c. (3) d. (3)

3. Rewrite the following as a decimal number.

- a. 1.98×10^4 19,800
 b. 3.894×10^{-5} .00003894
 c. 8.342×10^5 834,200

← No decimal!

4. Which is longer, a piece of fabric 100 cm long or a piece 0.50 m long?

100 cm = 1 m > .50 m

5. Indicate the number of sig figs in each of the following.

- a. 12 (2)
 b. 1098 (4)
 c. 2000. (4)
 d. 2.001×10^3 (4)
 e. 0.0000101 (3)

6. Round off each of the following numbers to four sig figs.

- a. 123,431 123400
 b. 1.2321 1.232
 c. 550092 550100

← No Decimal

7. Evaluate each of the following, and write the answer to the appropriate number of sig figs.

- a. $(0.102)(0.0821)(273)/(1.01) = 2.26$
 b. $(0.14)(6.022 \times 10^{23}) = 8.4 \times 10^{22}$
 c. $44.02 - 0.982 = 43.04$

8. Perform the following conversions utilizing dimensional analysis.

- a. 363 ft to inches in $\rightarrow$ ft 1 ft = 12 in

$$\frac{363 \text{ ft}}{1 \text{ ft}} \times \frac{12 \text{ in}}{1 \text{ ft}} = 4360 \text{ in} \quad 3 \text{ sig figs}$$

- b. 62.4 cm to inches

$$\text{cm} \rightarrow \text{in} \quad 1 \text{ in} = 2.54 \text{ cm}$$

$$\frac{62.4 \text{ cm}}{2.54 \text{ cm}} \times \frac{1 \text{ in}}{1 \text{ in}} = 24.6 \text{ in} \quad 3 \text{ sig figs}$$

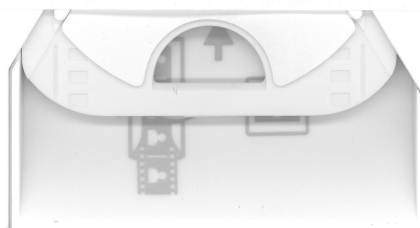
- c. 38940 km to miles

$$\text{km} \rightarrow \text{mi}$$

$$1 \text{ mi} = 1.61 \text{ km}$$

$$\frac{38940 \text{ km}}{1.61 \text{ km}} \times \frac{1 \text{ mi}}{1 \text{ mi}} = 24186.3354 \text{ mi}$$

$$\boxed{24200 \text{ mi}} \quad 3 \text{ sig figs}$$



9. What are the metric base units for length? Mass? Volume?

Length - meter (m)
Mass - gram (g)
Volume - Liter (L) ← Capital

10. What is the mass of the material present, if the volume is 51.5 mL and the density is 8.9 g/mL?

$$D = \frac{m}{V} \quad (2) \quad m = D \cdot V \quad (3)$$

$$\frac{8.9 \text{ g}}{\text{mL}} / 51.5 \text{ mL} = 458.35 \text{ g}$$

460 g 2 sig fig

11. How much heat is required to raise the temperature of 500.0 grams of water 25.2 °C?

Heat (J) → $Q = m C_p \Delta T$

mass (g) → m
 C_p → $\text{J/g}^\circ\text{C}$
 ΔT → change in Temp ($^\circ\text{C}$)

Sometimes shown as "S"

$$C_p (\text{water}) = 4.184 \text{ J/g}^\circ\text{C}$$

$$Q = \frac{500.0 \text{ g}}{\text{g}^\circ\text{C}} / \frac{4.184 \text{ J}}{\text{g}^\circ\text{C}} / 25.2^\circ\text{C} = 52718.4 \text{ J}$$

52700 J
3 sig Figs

