

$$4.3 \text{ yr} \times \frac{365 \text{ d}}{1 \text{ yr}} \times \frac{24 \text{ h}}{1 \text{ d}} \times \frac{60 \text{ min}}{1 \text{ h}} \times \frac{60 \text{ s}}{1 \text{ min}} =$$

$$11.34 \text{ g/cm}^3 = \text{---} \text{ kg/dm}^3$$

$$\frac{11.34 \text{ g}}{1 \text{ cm}^3} \times \frac{1 \text{ kg}}{1000 \text{ g}} \times \frac{1 \text{ cm}^3}{1 \text{ mL}} \times \frac{1000 \text{ mL}}{1 \text{ L}} \times \frac{1 \text{ L}}{1 \text{ dm}^3} = 11.34 \frac{\text{kg}}{\text{dm}^3}$$

$$\text{cm}^3 \rightarrow \text{mL} \rightarrow \text{L} \rightarrow \text{dm}^3$$

$$15000 \text{ mol CH}_4 \times \frac{2 \text{ mol NH}_3}{3 \text{ mol CH}_4} = 10,000 \text{ mol NH}_3$$

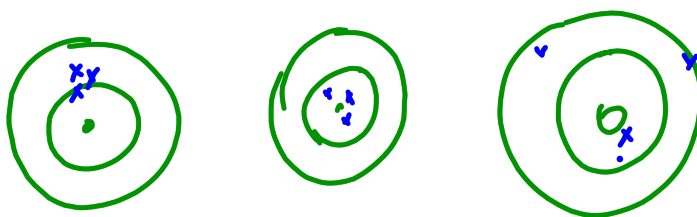
$$10,000 \text{ mol NH}_3 \times \frac{22.4 \text{ L}}{1 \text{ mol NH}_3} = 224,000 \text{ L}$$

$$1 \times 10^4 \text{ mol NH}_3 \times \frac{6.02 \times 10^{23} \text{ molecules}}{1 \text{ mol NH}_3} = 6.02 \times 10^{27} \text{ molec.}$$

$$6.02 \text{E}27$$

Precision — closeness of measurements to each other

Accuracy — closeness to the standard



14 cm	13.4 13.25	13.20
13.5 <u>13.5</u>	13.2	13.3
13	13.6 13.166	

Significant Digits (Figures) = include all known digits + 1 estimated digit.

Rules for Determining Sig Figs

- only measurements have sig figs
 counting #s do not

1) All non-0's are signif.

1234 m - 4 s.f.

2) 0s between non 0s are sig.

120034 cm 6 s.f

3) 0s after a dec. pt. AND after a non 0 are sig.

12.340 cm 5 s.f.

11.0 cm 3 s.f.

110.0 4 s.f.

4) placeholder 0s are NOT signif.
 (but are very IMPORTANT)

123,000 cm 3 s.f.

.000123 3 s.f.

0.1 m
 ↖ not sig.

101 - 3 1.0 × 10⁴ - 2 10,000

101.01 5 1.00 × 10⁴ - 3 10,000

101.00 5 0.00100 - 3

10,000 1

10,000 3

CALCULATIONS WITH SIG FIGS

 \times or \div

answer has the same # of sig figs as
the # w/ the fewest

$$\begin{array}{ccc} 13.3 \text{ cm} & \times & 25 \text{ cm} & = & 332.5 \text{ cm}^2 \\ 3 & & 2 & & \boxed{330 \text{ cm}^2} \end{array}$$

$$\frac{14.318 \text{ g}}{2.1 \text{ mL}} = 6.818095238$$

$\boxed{6.8 \frac{\text{g}}{\text{mL}}}$

+ or -

answer has the same # of dec. places
as the # w/ the fewest

$$\begin{array}{r} 15.1 \text{ cm} \\ 4.364 \\ .23 \\ \hline 19.694 \text{ cm} \end{array}$$

19.7cm