Warm-up:

Determine the # of SF's

1. 8001 g — 4 SF's
2. 0.0400 m — 3 SF's
3. 1200 mL — 2 SF's
4. 4.001 kg — 4 SF's
5. 14000 s — 2 SF's
6. 55.6 cg — 3 SF's
7. 1.04×10^{-3} kg — 3 SF's
8. 120.800 m — 6 SF's
9. 0.00080 miles — 2 SF's
10. 1,000,000 — 1 SF
11. 2.1×10^{8} m — 2 SF's
12. 0.000352 mL — 3 SF's
13. 40 m — 1 SF
14. 100,450 s — 5 SF's
15. 8×10^{-3} mL — 1 SF
16. 101,008,004.200 — 12 SF's

DOT Right → NOT Left

decimal? count from → No decimal? count from

Ex: #1 54.08 mL ✓✓✓✓ 4 SF's

#2: 360 g ✓✓x 2 SF's

#3 0.0120 g xxxxx 3 SF's

#4 6,020 mL ✓✓x 3 SF's

- Addition/Subtraction: round to lowest # of decimals

$$\begin{array}{r} 2.854 \\ +\ 11.6 \\ \hline 14.454 \end{array} = \boxed{14.5}$$

- Multiplication/Division: round to lowest Sig Fig

$$\begin{array}{r} 12.0 \quad 3\text{ SF} \\ \times\ 8.5 \quad 2\text{ SF} \\ \hline 6.00 \\ +\ 96.00 \\ \hline 102.00 \end{array}$$

100 → $1.0 \cdot 10^{2}$

- Scientific Notation: shorthand for expressing very large and/or small #'s

(−) exponents = #'s < 1

(+) exponent = #'s > 1

- Ex 1: $6.2 \cdot 10^{3}$ → 6,200 = 6,200
- Ex 2: $1.27 \cdot 10^{-2}$ → 0.01.27 → 0.0127
- Ex 3: 5,800 → 5,800 $5.8 \cdot 10^{3}$
- Ex 4: 0.00056 32 → 0.00056 32 $5.632 \cdot 10^{-4}$
- Ex 5: 15,682 → $1.5682 \cdot 10^{4}$
- Ex 6: convert # 5 into full form w/ 3 SF's

15,682 → 15,700

Read 3.2 → pg 62 13-16

section review 3.2

13. Explain the differences between accuracy, precision, and error of a measurement.

14. Determine the number of significant figures in each of the following measurements and calculation results.

    a. 12 basketball players
    b. 0.010 square meter
    c. 507 thumbtacks
    d. 0.070 020 meter
    e. 10 800 meters
    f. 5.00 cubic meters

15. Solve the following and express each answer in scientific notation.

    a. $(5.3 \times 10^4) + (1.3 \times 10^4)$
    b. $(7.2 \times 10^{-4}) \div (1.8 \times 10^3)$
    c. $10^4 \times 10^{-3} \times 10^6$
    d. $(9.12 \times 10^{-1}) - (4.7 \times 10^{-2})$
    e. $(5.4 \times 10^4) \times (3.5 \times 10^9)$
    f. $(1.2 \times 10^2) \times (8.9 \times 10^2)$

16. A technician experimentally determined the boiling point of octane to be 124.1 °C. The actual boiling point of octane is 125.7 °C. Calculate the error and the percent error.