

Scientific Notation

- More convenient way to express very large + small numbers.
- To express an answer with the correct # of significant digits.

$$\underline{n} \times 10^{\text{?}} \leftarrow \text{any integer}$$

$$1 \leq n < 10$$

$$1. \quad \underline{156.90} = 1.5690 \times 10^2$$

$$2. \quad \underline{12\,000} = 1.2 \times 10^4$$

$$3. \quad \underline{0.0345} = 3.45 \times 10^{-2}$$

$$4. \quad \underline{0.00890} = 8.90 \times 10^{-3}$$

$$5. \quad 1.23 \times 10^6 = 123\,0000$$

$$6. \quad 2.5 \times 10^{-3} = 0.0025$$

$$7. \quad 1.54 \times 10^4 = 15400$$

$$8. \quad 5.67 \times 10^{-1} = 0.567$$

Calculations involving Scientific Notation

Multiplication + Division:

$$9. \quad \frac{(6.6 \times 10^{-8})}{(3.3 \times 10^{-4})} = 2.0 \times 10^{-4}$$

$$\leftarrow -8 - (-4) = -8 + 4 = -4$$

Subtract exponents when dividing

$$14. \quad (2.5 \times 10^{-6}) \times (3.0 \times 10^{-7}) = 7.5 \times 10^{-13}$$

$\leftarrow -6 + (-7) = -13$
add the exponents when multiplying.

Addition + Subtraction

$$\begin{aligned} 13. \quad & (1.56 \times 10^{-7}) + (2.43 \times 10^{-8}) \\ & = (15.6 \times 10^{-8}) + (2.43 \times 10^{-8}) \\ & = 18.03 \times 10^{-8} \\ & = 1.803 \times 10^{-7} \end{aligned}$$

$$\begin{array}{r} 1253.8 \\ 1.25 \\ 13.1 \\ + 425 \\ \hline \end{array}$$