

Scientific Notation

- convenient way to express very large or very small numbers
- to express an answer with the correct number of significant digits.

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

.....-3,-2,-1,0,1,2,3.....

$$1 \leq n < 10$$

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

$$2. \quad \underline{12000} = 1.2 \times 10^4$$

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

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

$$5. \quad 1.23 \times 10^6 = 1230000$$

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

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

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

$$6.02 \times 10^{23} = 602 + 21 \text{ zeroes.}$$

Calculations Involving Scientific Notation

Multiplication & Division: $-8 - (-4)$

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

$$\frac{x^5}{x^3} = x^2$$

* dividing \Rightarrow subtract exponents.

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

$$-6 + (-7)$$

* multiply \Rightarrow add exponents.

Addition & Subtraction:

$$13. \quad (1.56 \times 10^{-7}) + (2.43 \times 10^{-8})$$

$$\begin{array}{r} 128.5 \\ 3.21 \end{array}$$

$$= (15.6 \times 10^{-8}) + (2.43 \times 10^{-8})$$

$$\begin{array}{r} 1456 \\ \hline \end{array}$$

$$= 18.03 \times 10^{-8}$$

* the exponents on the 10 must be the same

$$= 1.803 \times 10^{-7}$$