

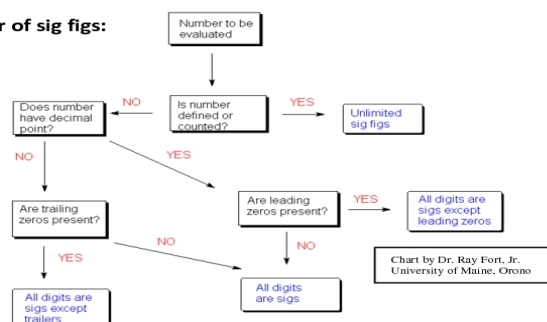
Dimensional Analysis and Significant Figures

Determine the number of significant digits in each of the following:

1. 23.30 cm
2. 1,843.02 L
3. 2.00012 km
4. 0.0001010450 sec
5. 3.65 kg
6. 0.5°C

Answer the following equations with the correct number of sig figs:

7. $3.414 \text{ s} + 10.02 \text{ s} + 58.325 \text{ s} + 0.00098 \text{ s}$
8. $2.326 \text{ h} - 0.000104 \text{ h}$
9. $10.19 \text{ m} \times 0.013 \text{ m}$
10. $140.01 \text{ cm} \times 26.042 \text{ cm} \times 0.0159 \text{ cm}$
11. $(7.4 \times 10^{10}) / (3.7 \times 10^3) =$
12. $(2.5 \times 10^{-8}) \times (3.0 \times 10^{-7}) =$



Dimensional Analysis

For the following problems, use conversion factors in the way that was discussed in class. Remember, your answers must have the correct number of significant figures. Use conversion factors to show your work.

$$? \text{ (unit desired)} = (\text{original amount and unit}) \cdot \left(\frac{\text{---}}{\text{---}} \right) \cdot \left(\frac{\text{---}}{\text{---}} \right) \cdot \left(\frac{\text{---}}{\text{---}} \right)$$

13. If it takes 2.5 scoops of coffee to make one pot of coffee each day, how many pots of coffee will I be able to make with 2.6 pounds? (37 scoops of coffee per pound).

14. How many milliliters are in 7.40 butts of water?

$$\begin{aligned} 1.00 \text{ butt} &= 128 \text{ gallons} \\ 1.00 \text{ gallon} &= 4.404 \text{ L} \\ 1 \text{ L} &= 1000 \text{ mL} \end{aligned}$$

15. To catch their fish, halibut fishermen use a long piece of rope called a "skate" which has hooks attached to it at given intervals. A skate is 1800.0 feet long and has 1 hook every 18 feet.

If we caught 12,398 lbs on 6 skates, how many...

- a) pounds of halibut per hook did we catch?
- b) kilograms per hook? (assume 2.2 pounds per kilogram).

Answer Key					
1. 4 sig figs	2. 6 sig figs	3. 6 sig figs	4. 7 sig figs	5. 3 sig figs	6. 1 sig fig
7. 71.76 s	8. 2.326 h	9. 0.13 m ²	10. 58.0 cm ³	11. 2.0x10 ⁷	12. 7.5x10 ⁻¹⁵
13. 38 pots	14. 4.17x10 ⁶ mL H ₂ O	15 a. 20 lbs/hook		15 b. 9.8 kg/hook	