

## Mathematics and Moles

### Significant Figures

Rules for sig figs:

- 1.
- 2.
- 3.
- 4.
- 5.

Adding/Subtracting with sig figs

Rule:

Examples

Multiplying/Dividing with sig figs:

Rule:

Examples

Working with Exponents

Measurement	Number of significant digits in measurement
88	
706	
100.0	
100	
100.	
0.007	
0.0070	

Convert:

Regular Notation	Scientific Notation
56 000 000	
93 900 000 000	
0.000 000 000 000 000 020	
0.000 000 096	

1. A pool measures 10.0 meters by 23.2 meters. What is the area of the pool?

2. What is the perimeter of the pool?

3. If the pool is 5 meters deep what is the volume of the pool?

4. A block of unknown material is measured and found to be 15.50 cm by 9.712 cm by 0.798 cm. It is massed and found to have a mass of 4.325 g. Will this block of unknown material float in water?

5. A piece of aluminum foil measures 9.90 cm by 10.12 cm. It has a mass of 0.24 grams. What is the thickness of the aluminum foil? The density of aluminum is 2.70 g/mL.

### Mole Conversions

What is a mole?

What is molar mass/molecular weight/molecular mass?

Calculate the molar mass of the following substances:

1. KBr \_\_\_\_\_ g/mole

3.  $\text{Al}_2\text{O}_3$  \_\_\_\_\_ g/mole

2.  $\text{Mg}(\text{NO}_3)_2$  \_\_\_\_\_ g/mole

4.  $\text{K}_3\text{PO}_4$  \_\_\_\_\_ g/mole

Molecules A ----- Moles A ----- Mass A ----- Volume A

1. How many moles of copper are present in  $1.2 \times 10^{22}$  copper atoms?
2. How many molecules of  $N_2$  are in 0.040 moles of nitrogen?
3. How many moles of  $PCl_5$  are in 5.4 g of  $PCl_5$ ?
4. Which contains the greater number of moles, 3.5 g of carbon dioxide or 3.5 g of NaCl?
5. How many molecules of water are in 25.00 g of water?