

## Solution Calculations - Maple TA type questions

For each of the following questions, ask yourself:

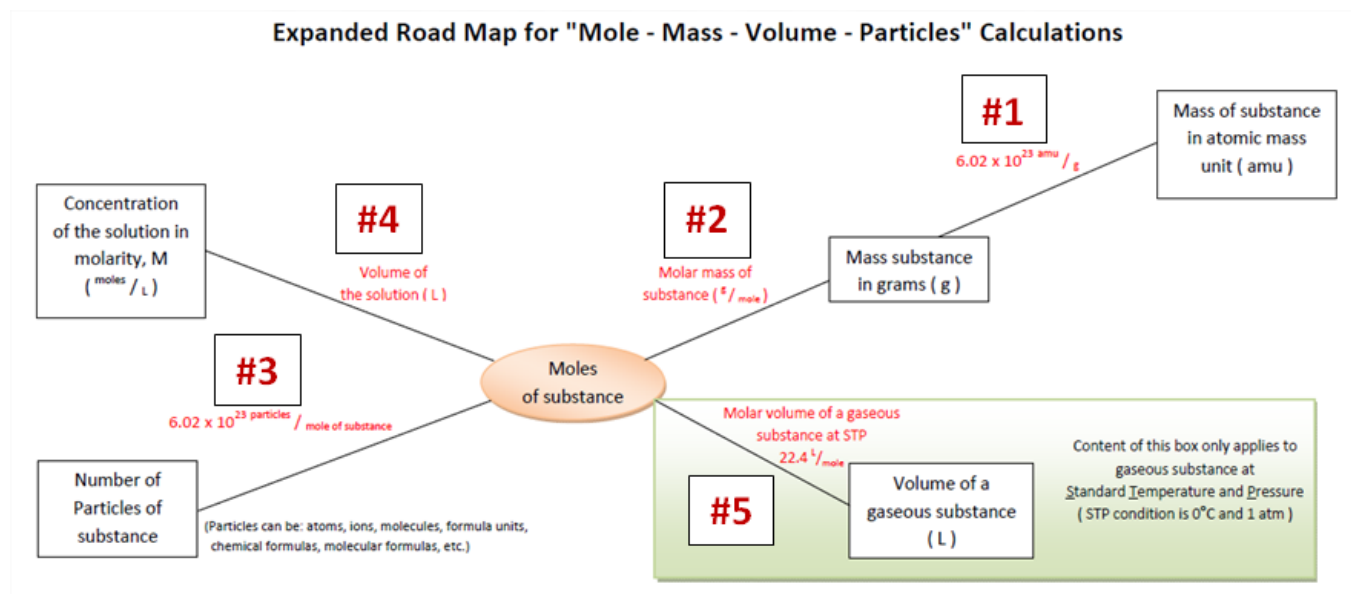
Is it a dilution question?

If yes, then the plan of action is:

Use dilution equation  $C_1V_1 = C_2V_2$

If no, then the plan of action is:

Locate where you are on the road map and determine the conversion factor(s) needed.



1. Calculate the molarity of the solution that was prepared by diluting 9.46 mL of 1.4 M BaCl<sub>2</sub> solution to 91.8 mL?

Plan of Action:

2. If a student withdraws 21.9 mL from a 5.9 M KOH solution in order to prepare a 2.534 M KOH solution, what is the final volume of the dilute solution in liters?

**Plan of Action:**

3. A  $\text{KNO}_3$  solution is 2.500 M. How many  $\text{K}^+$  ions are in 3.00 milliliters of solution?

**Plan of Action:**

4. Calculate the concentration in M (molarity) of a nitric acid,  $\text{HNO}_3$ , solution that contains 208.9 mg of nitric acid,  $\text{HNO}_3$ , in 20.00 mL of solution.

**Plan of Action:**

5. When 406.5 grams of sugar,  $\text{C}_{12}\text{H}_{22}\text{O}_{11}$ , is dissolved in 250.0 mL, the concentration of the sugar solution is

**Plan of Action:**

6. A  $\text{BaCl}_2$  solution is 2.500 M. How many  $\text{Cl}^-$  ions are in 8.00 milliliters of solution?

**Plan of Action:**

7. If a student withdraws 38.4 mL from a 5.4 M  $\text{H}_2\text{SO}_4$  solution in order to prepare a 3.288 M  $\text{H}_2\text{SO}_4$  solution, what is the final volume of the dilute solution in liters?

**Plan of Action:**

8. Calculate the molarity of the solution that was prepared by diluting 8.41 mL of 1.3 M NaCl solution to 83.7 mL?

**Plan of Action:**

9. A student wants to prepare 3.43 liter of a 3.527 M  $\text{H}_2\text{SO}_4$  solution. How many milliliters of the 6.5 M  $\text{H}_2\text{SO}_4$  solution do they need?

**Plan of Action:**

10. In order to make 500.0 mL of a 0.066 M  $\text{AlCl}_3$  solution, a student needs to pipet 0.00834 L from a more concentrated  $\text{AlCl}_3$  solution. What must be the molarity of the more concentrated  $\text{AlCl}_3$  solution?

**Plan of Action:**

