CONCEPT: THE IDEAL GAS LAW DERIVATIONS

- By rearranging *The Ideal Gas Law* we can derive new equations connected to _____ , _____, _____ or _____ .
  - □ These derivations are required when we have *variables with 2 sets of different values*.

EXAMPLE: A sample of sulfur hexachloride gas occupies 8.30 L at 202 ºC. Assuming that the pressure remains constant, what temperature (in ºC) is needed to decrease the volume to 5.25 L?

STEP 1: Begin by writing out the Ideal Gas Law Formula.

STEP 2: **Circle** the variables in the Ideal Gas Law Formula that have two sets of different values.

STEP 3: **Cross out** the variables in the Ideal Gas Law Formula that are not discussed or are remaining the same.

- □ Since the R constant will be the same value we can always ignore it.

STEP 4: Algebraically **move** all the circled variables to the left side of the Ideal Gas Law Formula.

STEP 5: Make these circled variables equal to the second set of identical variables in order to derive a new formula.

- □ If temperature is involved in the calculation, it must be in the SI unit of _____.

CONCEPT: THE IDEAL GAS LAW DERIVATIONS

PRACTICE: A sample of nitrogen dioxide gas at 130 ºC and 315 torr occupies a volume of 500 mL. What will the gas pressure be if the volume is reduced to 320 mL at 130 ºC?

PRACTICE: A cylinder with a movable piston contains 0.615 moles of gas and has a volume of 295 mL. What will its volume be if 0.103 moles of gas escaped?

PRACTICE: On most spray cans it is advised to never expose them to fire. A spray can is used until all that remains is the propellant gas, which has a pressure of 1350 torr at 25 ºC. If the can is then thrown into a fire at 455 ºC, what will be the pressure (in torr) in the can?