	Per: Date:	
	Notes - Gas Laws	
11 variables	Simula de anglabaca milan renerring to gables.	
VPT	, n (moles, amount of gas)	
Why is it not necessary to dis	scuss pressure when dealing with solids and liquids?	
You can't comp	press Solid + liquid	
Boyle's Law: P V	se inversely proportional.	
Equation	$P \cdot V_2 = V$ Variable Constants	
P.V.=	volume Temp &	5
KI:	= KZ D.V. = P.V. Pressure	F
COVAC	gas (n)	)
	2.0 L is filled with a gas at 3 atmospheres. If the pressure were reduce a change in temperature, what would be the volume of the balloon?	ed
ven one Vi= 2.0L	u: V=7 5+5: , DV	
	$V_2 = P_1 V_1$	_
bistitute 11 0.50	atm E: P, V = P2	,
olve Y2 =	P2 - Re	(3 atm
What temperature scale must	st be used when talking about gases? Kelvin (k)	Satr
Charles Law: T+V	1, direct	12
Equation	Variable Constants	
V1 - V2	VI = V2 T	
T - 12 - T	Ti Tz	
12	V	
1 (00 1 1 6 %	is heated from 27 °C to 77 °C at constant pressure. What is the final	
valuma?		
volumo?		
valuma?		
volumo?		607
volume?) $T_1 = 600 \text{ mL}$ $T_2 = 77 + 273 = 72 + 273 = 72 + 273 = 73 + 273$	= 300K $u: V_2 = ?$ $V_2 = T_2 V_1$	607 00 X
volume? $T_1 = 600 \text{ mL}$ $T_2 = 77 + 273 = 72 + 273 = 72 = 73 + 273 = 73 = 73 = 73 = 73 = 73 = 73 = 73 $	= 300K $U: V_2 = ?$ $V_2 = T_2 V_1$ = 350K $E: V_1 = V_2$ . $T_1 = V_2$ . $T_2 = 350K$	00 X
volume? $T_1 = 600 \text{ mL}$ $T_2 = 77 + 273 = 77 + 27$	$V_{2} = T_{2}V_{1}$ $= 350K$ $E \cdot V_{1} = V_{2}$ $= 350K$ $E \cdot V_{1} = V_{2}$ $= 350K$ $= 350K$ $= 350K$ warmed from 50.0 to 100. degrees Celsius. What is the new volume if	00 X
volume? $T_1 = 600 \text{ mL}$ $T_2 = 77 + 273 = 77 + 27$	$V_{2} = T_{2}V_{1}$ $= 350K$ $E \cdot V_{1} = V_{2}$ $= 350K$ $= 350K$ $= 350K$ $= 350K$ $= 350K$ warmed from 50.0 to 100. degrees Celsius. What is the new volume if $V_{2} = V_{3}$ $= V_{4} = V_{5}$	500 X
volume? $T_1 = 600 \text{ mL}$ $T_2 = 77 + 273 = 77 + 27$	= 300K $U$ : $V_2 = ?$ $V_2 = T_2 V_1$ = 350K $U$ : $V_2 = T_2 V_1$ = 350K $U$ : $V_2 = ?$ $U$ : $V_2 = ?$ $V_2 = T_2 V_1$ = 323K $V_2 = ?$ $V_2 = T_2 V_1$	00 X
volume? $T_1 = 600 \text{ mL}$ $T_2 = 77 + 273 = 77 + 27$	= 300K $U$ : $V_2 = ?$ $V_2 = T_2 V_1$ = 350K $U$ : $V_2 = T_2 V_1$ = 350K warmed from 50.0 to 100. degrees Celsius. What is the new volume if $V$ : $V_2 = ?$ $V_2 = T_2 V_1$ $V_3 = T_2 V_1$ $V_4 = T_2 V_1$ $V_5 = T_3 V_4$ $V_6 = T_2 V_1$ $V_7 = T_2 V_1$ $V_8 = T_2 V_1$ $V_8 = T_3 V_4$ $V_8 = T_4 V_4$	the 700
volume? $T_1 = 600 \text{ mL}$ $T_2 = 77 + 273 = 77 + 27$	= 300K $U$ : $V_2 = ?$ $V_2 = T_2 V_1$ = 350K $U$ : $V_2 = T_2 V_1$ = 350K $U$ : $V_2 = ?$ $U$ : $V_2 = ?$ $V_2 = T_2 V_1$ = 323K $V_2 = ?$ $V_2 = T_2 V_1$	the 700
volume? $T_1 = 600 \text{ mL}$ $T_2 = 77 + 273 = 72 + 273 = 72 + 273 = 73 = 73 = 73 = 73 = 73 = 73 = 73 $	warmed from 50.0 to 100. degrees Celsius. What is the new volume if $V_2 = \frac{1}{1}$ . $V_2 = \frac{1}{1}$ . $V_3 = \frac{1}{1}$ . $V_4 = \frac{1}{1}$ . $V_2 = \frac{1}{1}$ . $V_2 = \frac{1}{1}$ . $V_3 = \frac{1}{1}$ . $V_4 $	the 700
volume? $T_1 = 600 \text{ mL}$ $T_2 = 77 + 273 = 72 + 273 = 72 + 273 = 73 = 73 = 73 = 73 = 73 = 73 = 73 $	warmed from 50.0 to 100. degrees Celsius. What is the new volume if $V_2 = \frac{1}{1}$ . $V_2 = \frac{1}{1}$ . $V_3 = \frac{1}{1}$ . $V_4 = \frac{1}{1}$ . $V_2 = \frac{1}{1}$ . $V_2 = \frac{1}{1}$ . $V_3 = \frac{1}{1}$ . $V_4 $	the 700
volume? $T_1 = 37 + 273 = 77 + 2$	warmed from 50.0 to 100. degrees Celsius. What is the new volume if $V_2 = \frac{7}{11} = \frac{7}{12} = \frac$	the 700

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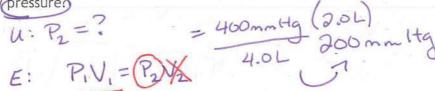
## Boyle's Law & Charles' Law Problems

Instructions: Complete the following problems.

Boyle's Law can be summarized mathematically as  $P^*V$  = constant, which means that  $P_1V_1 = P_2V_2$ . Another way to think about the subscript 1 is initial and the subscript 2 means a final amount. What variable must be kept constant in order for this law to be true??

1. If a 2.0 L sample of gas at 400 mmHg of pressure is moved to a 4.0 L container at a constant temperature, what is the new pressure?

G: V. = 2.0L P, = 400mmHg V2 = 4.0 L

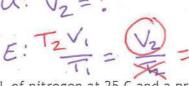


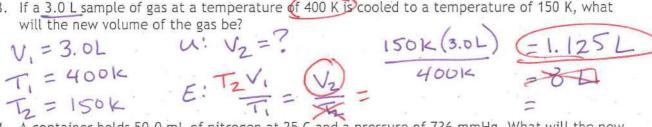
2. If a 15.0 L sample of gas at 2 atm of pressure is compressed to 6 atm of pressure at a constant temperature, what will the new volume be?

\*\*HINT: It doesn't matter that the units for pressure are different from the previous problem.

Charles' Law is written as V/T = constant, which means  $V_1/T_1 = V_2/T_2$ . It is NECESSARY to have the units for temperature in Kelvin, K. This means that you might have to convert the temperature from Celsius to Kelvin. Refer to the simulation from yesterday for help if you need it. What variable must be kept constant in order for this law to be true??

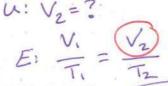
3. If a 3.0 L sample of gas at a temperature of 400 K is cooled to a temperature of 150 K, what

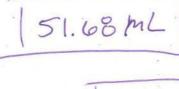




4. A container holds 50.0 mL of nitrogen at 25 C and a pressure of 736 mmHg. What will the new volume be if the temperature increases to 35 C?

\*\*HINT: Does the number for pressure in this problem matter?? V. = 50.0~L





 $T_1 = 25^{\circ}c + 273 = 298 \text{ K}$   $T_2 = 35 + 3273 = 308 \text{ K}$ 5. A gas at 27.0 C has a volume of 6.00 L. What will the new temperature be if the volume is 125 Kdecreased to 2.50 L?

T, = 27.0+273=300KU: T2=?

