Boyle's Law Practice

STP = "Standard Temperature and Pressure"
Standard Temperature = 273 K
Standard Pressure = 1.00 atm = 101.325 kPa = 760 mm Hg = 760 torr
Boyle's Law is an indirect relationship.

Most of these problems can be done in your head without showing your work.

1. Herman has 30.0 L of helium gas trapped in a cylinder by a piston. The pressure of the gas is 1.0 atmosphere.
   A) What will the pressure become if the volume is reduced to half of its original value?
   B) What will the pressure become if the volume is doubled?
   C) What will the pressure become if the volume is tripled?
   D) What will the pressure become if the volume is reduced to 10.0 L?
   E) What will the volume become if the pressure is doubled?
   F) What will the volume become if the pressure is tripled?
   G) What will the volume become if the pressure is reduced to half of its original value?
   H) What will the volume become if the pressure is increased to 5.0 atmospheres?

2. Melanie and Violetta performed an experiment where they took a gas trapped in a cylinder, adjusted the volume and then measured the resulting pressure. Make a graph of their data and use it to answer the following questions.

Volume (mL)	Pressure (atm)
40	5.00
80	2.50
120	1.67
160	1.25
200	1.00
240	0.83
280	0.71
320	0.62
360	0.56
400	0.50

   A) Predict the pressure for a volume of 100 mL.
   B) Predict the pressure for a volume of 250 mL.
   C) Predict the volume for a pressure of 4.00 atm
   D) Predict the volume for a pressure of 0.90 atm.
   E) Predict the volume for a pressure of 1.75 atm.
   F) Predict the pressure for a volume of 800 mL.

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Please use your head, but show your work in the manner demonstrated by your instructor. Remember to include the correct units and round off to significant digits.

These problems should be done on a separate sheet of paper.

3. What was the original volume of a gas that was collected at an atmospheric pressure of 0.750 atm if it now occupies a volume of 22.4 L at 1.00 atm?

4. A gas is confined to a volume of 900. cm^3 at a pressure of 1.80 atm What would its pressure be if the volume is decreased to 300. cm^3?

5. What was the original pressure of a gas that was confined in a volume of 250 cm^3 if it is now occupying 400. cm^3 at a pressure of 2.00 atm?

6. A gas is confined to a volume of 120 cm^3 at a pressure of 8.00 atm. What would its volume be at standard pressure?

7. A gas has a pressure of 1.50 atm. What happens to the pressure if it's volume is doubled?

8. The volume of a gas is 40.0 mL at 900. torr. What is the new volume if the pressure is changed to 400 torr?

9. A sample of Helium at 1500 kPa and 450 mL is compressed to 225 mL. What is the new pressure?

10. A balloon holds 975 mL of gas at 760 mm Hg. It is then expanded to 2000 mL. What is the new pressure?