

Gas Pressure – Converting Units of Measure (Std 4c)

Converting units of measure for gas pressure is just like doing conversion of :

Mg ---> g ---> to ---> moles ---> atoms

Review my tutorial on that in the tutorial: [Grams to moles to atoms - Tutorial](#) or [PDF](#)

There are bridges for these conversions just as there were for those. Everything is based on 4 basic equalities:

$$1 \text{ atm} = 760 \text{ mmHg}$$

$$1 \text{ atm} = 760 \text{ Torr}$$

$$1 \text{ atm} = 101,325 \text{ Pa}$$

$$1 \text{ atm} = 14.69 \text{ psi}$$

Converting from anything to anything else requires you to make one or all of the equalities above into fractions. The top of the fraction will always be what you are converting to.

Example: Convert 56 psi to atm's.

bridge

$$\frac{56 \text{ psi}}{1} \times \frac{1 \text{ atm}}{14.69 \text{ psi}} = \mathbf{3.81 \text{ atm}}$$

Now let's do an example of going through several steps:

Example: Convert 25,000 Pa's to Torr.

bridge

bridge

$$\frac{25,000 \text{ Pa}}{1} \times \frac{1 \text{ atm}}{101,325 \text{ Pa}} \times \frac{760 \text{ Torr}}{1 \text{ atm}} = \mathbf{187.52 \text{ Torr}}$$

Each bridge, or operation, is determined by where we start from and where we are going.

If you want to check your work and see that you came out to the right answer, check out the conversion-calculator web sites, see which one you prefer:

[Converter CALCULATOR – all types of units of measure conversions – applet \(Berkley\)](#)

[Converter for units of measure used in gas laws - USC](#)

The odd problems do not have answers in the back of the book, but you can check them out with this little calculator. All you have to do is put in the unit of measure you are starting with and then hit your tab key. The calculator will give you all the other units of measure and their correct quantities. To activate the calculator, click on "Click [Here](#)" You will find it on the left-hand side of the page $\frac{3}{4}$ of the way down. After you activate the calculator enlarge it to full page. Under the **Type of Conversion** (see upper left of screen), change the conversion type to pressure on the drop-down menu. Now you're ready to go.

Example: using this calculator (link also shown above)

[Converter CALCULATOR – all types of units of measure conversions – applet \(Berkley\)](#)

Problem

Convert 25,000 Pa to Torr (see problem above and then check the answer I gave with the calculator.

Solution

Click on Pascal as **Original Units** . Next, enter 25,000 on the calculator keyboard. The number you enter will be small and will be top center of the screen.

Now click **torr** in the **New Units** box. Next, press **Convert** in the lower left of the screen. Your answer in **torr** will appear in the top center of the screen.

Answer:

187.516 which represents **187.52** when rounded.