PRESSURE UNIT CONVERSIONS WORKSHEET

1 atm = 760 mm Hg = 101325 Pa = 14.7 lb/in² = 1.013 bar

1. The air pressure for a certain tire is 109 kPa. What is this pressure in atmospheres? *(Answer: 1.08 atm).*

2. The air pressure inside a submarine is 0.62 atm. What would be the height of a column of mercury balanced by this pressure? *(Answer: 470 mm Hg).*

3. The weather news gives the atmospheric pressure as 1.07 atm. What is this atmospheric pressure in mm Hg? *(Answer: 813 mm Hg).*

4. An experiment at Sandia National Labs in New Mexico is performed at 758.7 mm Hg. What is this pressure in atm? *(Answer: 0.998 atm).*

5. A bag of potato chips is sealed in a factory near sea level. The atmospheric pressure at the factory is 761.3 mm Hg. The pressure inside the bag is the same. What is the pressure inside the bag of potato chips in Pa? *(Answer: 1.01 x 10⁵ Pa).*

6. The same bag of potato chips from problem 5 is shipped to Denver, Colorado, where the atmospheric pressure is 99.82 kPa. What is the difference (in Pa) between the pressure in the bag and the atmospheric pressure? *(Answer: 1200 Pa).*
7. The pressure gauge on a compressed air tank reads 43.2 lb/in$^2$. What is the pressure in atm? \( \text{(Answer: 2.94 atm)} \).

8. The pressure in the tire of an automobile is 34.8 lb/in$^2$. What is the pressure in kPa? \( \text{(Answer: 240 kPa)} \).

9. Convert the following pressure units using unit analysis when necessary:

   a. \( 2 \text{ atm} = \underline{\text{_________ bar}} \)
   b. \( 2 \text{ bar} = \underline{\text{_________ atm}} \)
   c. \( 669 \text{ mm Hg} = \underline{\text{_________ bar}} \)
   d. \( 4.9 \text{ bar} = \underline{\text{_________ psi}} \)
   e. \( 113 \text{ kPa} = \underline{\text{_________ bar}} \)
   f. \( 35 \text{ bar} = \underline{\text{_________ Pa}} \)

10. On a warm, sunny day, a student uses a tire pressure gauge to test the air pressure of her tires. While listening to the weather report on the way to the garage, she finds that the barometric pressure is 780 mm Hg. If the gauge reads a pressure of 35 lb/in$^2$, what is the actual pressure inside the tires? Please give your answer in lb/in$^2$, mm Hg, atmospheres, and Pascals.