

Name: _____ Date: _____

m_r^β **Physics Practice: Sound pressure**

Up to this point, we have treated force as something that is applied at a point. In many situations, however, we are interested in forces that are distributed over an area. The force F distributed over an area A describes *pressure*, and we write

$$P = \frac{F}{A}$$

1. Suppose force F is measured in Newtons, and A in m^2 . Then what are the units for pressure?

2. The units in the previous problem are called *Pascals* (Pa). We are going to be studying *standard atmospheric pressure*. If a column of air with a cross-sectional area of 1 square inch contains 14.7 pounds of air, we say atmospheric pressure is 14.7 psi (pounds per square inch).

a. Convert 14.7 psi to Pascals, carefully showing all of your work.

b. We perceive sound because of small, rapid fluctuations in the air pressure next to our eardrums. The intensity of the fluctuations is often measured in *decibels*. Sustained sound levels above 90 decibels can cause hearing loss. A fluctuation of one Pa is perceived as 94dB (decibels). What percentage of standard atmospheric pressure is 1 Pa?

