1. The ratio of velocity of sound in air at 4atm and that at 1atm pressure would be …

$p_1 = 4\,atm = 4 \cdot 10^5\ Pa$ $p_2 = 1atm = 10^5\ Pa$	*Solution.*
$\eta - ?$	The velocity of sound in the gas can be calculated by the Laplace formula: $v = \sqrt{\frac{\gamma RT}{M}}$,

where R is the gas constant, T is the temperature of the gas, M is the molecular mass of the gas, γ is the ration of C_P to C_V ($\gamma = \frac{5}{3}$ for one-atom gas, $\gamma = \frac{7}{5}$ for two-atom gas, $\gamma = \frac{4}{3}$ for gas of three or bigger number of molecules).

According to the given formula, the velocity of sound in the gas does not depend on the pressure of the gas. Thus, the ration of velocity of sound in air at two different values of the pressure equals to 1. $\eta = 1$.

Answer: 1.