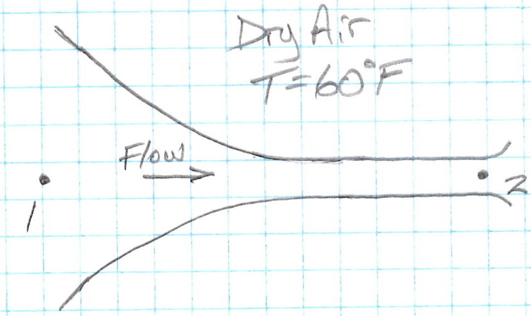
$P_1 = 14.696 \frac{lbf}{in^2}$

$V_1 = 0$

$\rho_1 = 0.0764 \frac{lbm}{ft^3}$



$P_2 = 13.675 \frac{lbf}{in^2}$

$V_2 = ?$

$\rho_2 = \rho_1$ (if incompressible)

actually $\rho_2 = 0.071 \frac{lbm}{ft^3}$

Bernoulli Equation

Internal Energy$_1$ + Kinetic Energy$_1$ + Potential Energy$_1$ = Internal Energy$_2$ + Kinetic Energy$_2$ + Potent Energy$_2$

$$P_1 + \frac{\rho_1 V_1^2}{2} + \rho_1 g h_1 = P_2 + \frac{\rho_2 V_2^2}{2} + \rho_2 g h_2$$

where: P = static pressure
ρ = density
V = velocity
g = acceleration due to gravity
h = relative height

since $V_1 = 0$ and $h_1 = h_2 = 0$ then equation becomes:

$$P_1 = P_2 + \frac{\rho_2 V_2^2}{2}$$

but, for incompressible flow $\rho_2 = \rho_1$:

$$P_1 = P_2 + \frac{\rho_1 V_2^2}{2}$$

rearrange the equation to solve for V_2:

$$V_2 = \sqrt{\frac{(P_1 - P_3) \times 2}{\rho_1}}$$

since $P_1 - P_3 = 28 \text{ in } H_2O = 1.012 \frac{lbf}{in^2} = 145.7 \frac{lbf}{ft^2}$

and $\rho_1 = 0.0764 \frac{lbm}{ft^3}$:

$$V_2 = \sqrt{\frac{145.7 \frac{lbf}{ft^3} \times 2 \times 32.174 \frac{lbm \cdot ft}{lbf \cdot s^2}}{0.0764 \frac{lbm}{ft^3}}} = 350.3 \frac{ft}{s}$$

$$350 \frac{ft}{s} \times \frac{60 s}{min} \times \frac{ft^2}{144 in^2} = 146 \frac{ft^3}{min \cdot in^2} \text{ or } 146 \frac{cfm}{in^2}$$