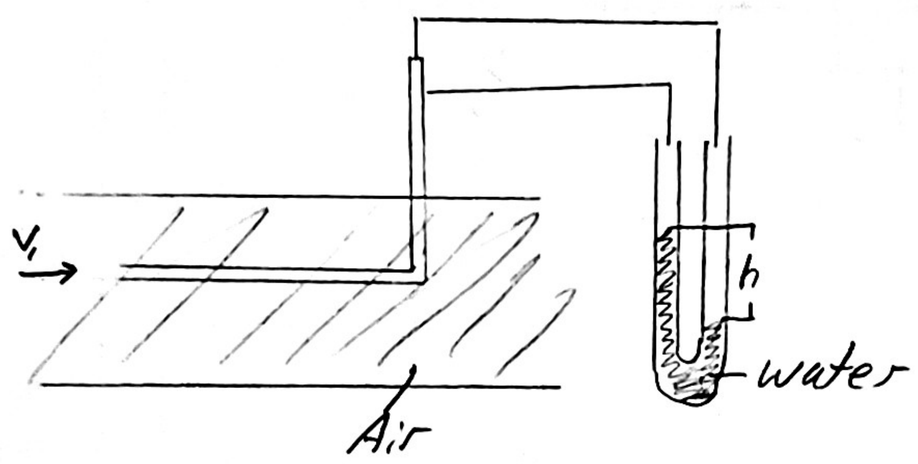
MET 330 HW23	John Miles	3-18-2020	1/1

Problem 15.15

Given Pitot-static tube is inserted into a duct carrying air at standard atmospheric pressure and a temperature of 80°F. A manometer reads 0.24 in of water

Find: velocity of flow

Solution:



$$V_1 = \sqrt{\frac{2gh(\gamma_w - \gamma_a)}{\gamma_a}}$$

$g = 32.2 \frac{ft}{s}$

$h = 0.24^{in} = 0.02^{ft}$

$\gamma_w = 62.2 \frac{lb}{ft^3}$

$\gamma_A = 0.0736 \frac{lb}{ft^3}$

$$V_1 = \sqrt{\frac{2 \cdot 32.2 \cdot 0.02 \ (62.2 - 0.073)}{0.073}}$$

$V_1 = 33.1 \frac{ft}{s}$