b) $v = 2.2\ m/s$

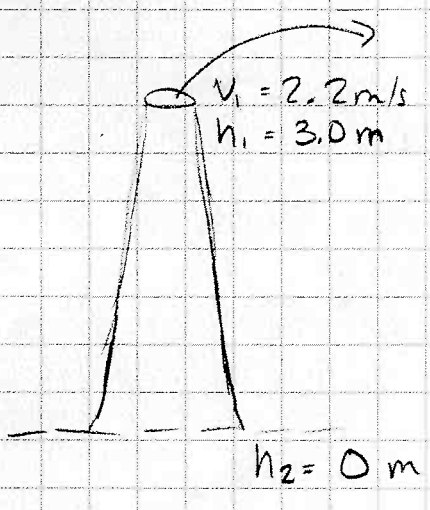
$r = 4.00 \times 10^{-3}\ m$

$A = \pi \cdot r^2 = \pi \cdot (4.0 \times 10^{-3}\ m)^2$
$= 5.0 \times 10^{-5}\ m^2$

Flow Rate $= A \cdot v = (5.0 \times 10^{-5}\ m^2)(2.2\ m/s)$

Flow Rate $= 1.13 \times 10^{-4}\ m^3/s$

c) $v_1 = 2.2\ m/s$ (from Part b)
$P_1 = 0$ (gauge pressure)
$r_2 = 7.00 \times 10^{-3}\ m$
$A_2 = \pi \cdot r^2 = \pi \cdot (7 \times 10^{-3}\ m)^2$
$= 1.54 \times 10^{-4}\ m^3$



Find v_2:

$A_1 \cdot v_1 = A_2 \cdot v_2$

$(1.13 \times 10^{-4}\ m^3/s) = (1.54 \times 10^{-4}\ m^3) \cdot v_2$

$v_2 = .73\ m/s$

Find P_2:

$\frac{1}{2} \cdot \rho \cdot v_1^2 + \rho \cdot g \cdot h_1 + P_1 = \frac{1}{2} \cdot \rho \cdot v_2^2 + \rho \cdot g \cdot h_2 + P_2$

$\frac{1}{2}(1000\ kg/m^3)(2.2\ m/s)^2 + (1000\ kg/m^3)(9.8\ m/s^2)(3.0m) + 0 =$

$\frac{1}{2}(1000\ kg/m^3)(.73\ m/s)^2 + 0 + P_2$

$P_2 = 31{,}600\ Pa$