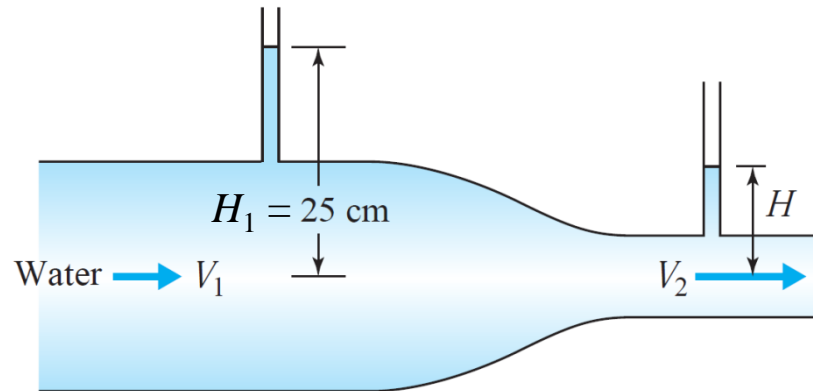


In the pipe contraction shown in Figure water ( $\rho = 1000 \text{ kg/m}^3$ ) flows steadily with a velocity of  $v_1 = 0.5 \text{ m/s}$  and  $v_2 = 1.125 \text{ m/s}$ . Two piezometer tubes are attached to the pipe at sections 1 and 2. Determine the height  $H$ . Neglect any losses through the contraction.



$$p_1 + \rho \frac{v_1^2}{2} + \gamma h_1 = p_2 + \rho \frac{v_2^2}{2} + \gamma h_2$$

$$\gamma H_1 + \rho \frac{v_1^2}{2} = \gamma H + \rho \frac{v_2^2}{2}$$

$$H = \frac{\gamma H_1 + \frac{\rho}{2}(v_1^2 - v_2^2)}{\gamma} = \frac{9800 \times 0.25 + 500 \times (0.5^2 - 1.125^2)}{9800} = 0.1982 \text{ m} = 19.82 \text{ cm}$$