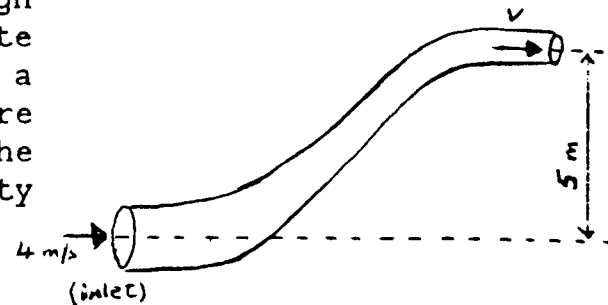


Water is flowing at 5.00 m/s in a pipe where the cross section is  $4.00 \text{ cm}^2$  and the pressure is  $1.5 \times 10^5 \text{ N/m}^2$ . If the area gradually becomes  $8.00 \text{ cm}^2$  at a point 10.0 m below the first point, find the pressure at the second point.

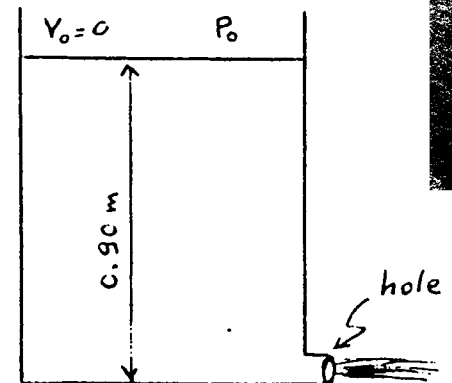
- A.  $2.57 \times 10^5 \text{ N/m}^2$
- B.  $2.31 \times 10^5 \text{ N/m}^2$
- C.  $1.42 \times 10^3 \text{ N/m}^2$
- D.  $0.79 \times 10^4 \text{ N/m}^2$
- E.  $3.10 \times 10^8 \text{ N/m}^2$

Water enters the first floor of a house through a pipe 2.0 cm in diameter and at an absolute pressure of  $4 \times (10^5) \text{ Pa}$ . The pipe leads to a second floor room 5 m above (see figure) where the diameter is 1.0 cm. The flow velocity in the inlet pipe is 4 m/s. What is the flow velocity and pressure in the second room ?



- A. 32 m/s ;  $9.90 \times (10^5) \text{ Pa}$
- B. 10 m/s ;  $16.60 \times (10^5) \text{ Pa}$
- C. 4 m/s ;  $4.00 \times (10^5) \text{ Pa}$
- D. 16 m/s ;  $2.31 \times (10^5) \text{ Pa}$
- E. 20 m/s ;  $1.80 \times (10^5) \text{ Pa}$

Water flows at the rate of 8.00 liter/min from a small hole at the bottom of a tank which is 0.900 m deep (see figure). Find the area of the hole.



- A.  $1.32 \times 10^{(-1)} \text{ m}^2$
- B.  $3.17 \times 10^{(-5)} \text{ m}^2$
- C.  $1.21 \times 10^{(-4)} \text{ m}^2$
- D.  $5.14 \times 10^{(-5)} \text{ m}^2$
- E.  $8.71 \times 10^{(-2)} \text{ m}^2$