

Answer on Question#37626 – Physics - Other

Two chambers are filled with a fluid. The ceiling of chamber 1 is at the same level as the floor of chamber 2. The pressure at the floor of chamber 2 is $1.7 \times 10^5 \text{ Pa}$. If the area of the ceiling of chamber 1 is 2.0 m^2 , what is the magnitude F of the force exerted by the fluid on the ceiling of chamber 1?

Solution:

$$\begin{aligned} \text{pressure} &= \frac{\text{force}}{\text{area}} \Rightarrow \text{force} = \text{pressure} \times \text{area} = 1.7 \times 10^5 \text{ Pa} \cdot 2 \text{ m}^2 \\ &= 340 \times 10^3 \text{ N} = 340 \text{ kN} \end{aligned}$$

Answer: magnitude of the force exerted by the fluid on the ceiling of chamber 1 is equal to 340 kN.

