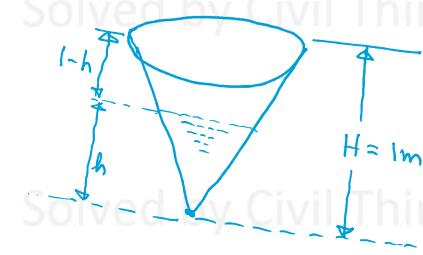


Hydrostatic Cone Problem Solution:

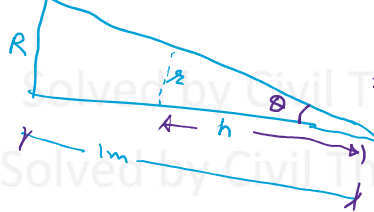
Water was poured into a vessel in the shape of an inverted cone with a height $H = 1\text{m}$ up to half of its capacity. Calculate the hydrostatic pressure at the lowest point inside the vessel.

Solution:

Solved by Civil Thinking (<https://civilthinking.com>)


$$V_w = \frac{1}{2} V_e$$
$$\Rightarrow \pi r^2 \times \frac{h}{3} = \frac{1}{2} \left(\pi R^2 \times \frac{H}{3} \right), H = 1\text{m}$$
$$\Rightarrow r^2 h = R^2 / 2 \Rightarrow h = \frac{R^2}{2r^2} \quad \text{--- ①}$$

Solved by Civil Thinking (<https://civilthinking.com>)


$$\Rightarrow \tan \theta = \frac{r}{h} = \frac{R}{1} \Rightarrow r = Rh$$

Put $r = Rh$ in ①

$$\Rightarrow h = \frac{R^2}{2R^2 h^2} \Rightarrow h^3 = \frac{1}{2}$$

Solved by Civil Thinking (<https://civilthinking.com>)

$$\Rightarrow h = \left(\frac{1}{2} \right)^{\frac{1}{3}} = 0.794\text{m}$$

$$P = \rho g h = 1000 \text{ kg/m}^3 \times 9.81 \text{ m/s}^2 \times 0.794 \text{ m} = 7789 \text{ N/m}^2$$

Ans.

This Fluid Mechanics problem was solved by Civil Thinking (<https://civilthinking.com>)

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