



AKADEMIA EDUKACYJNO - INŻYNIERSKA

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MATURA STUDIA PRAKTYKA STAŻ PRACA BIZNES PRZEMYSŁ STEAM

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MECHANIKA PŁYNÓW

"STATYKA PŁYNÓW – CIŚNIENIE HYDROSTATYCZNE"

PROJEKT

Oblicz:

– ciśnienie hydrostatyczne

dla punktu "H/2" różnej geometrii ściany płaskiej układu zbiornika wypełnionego cieczą.

DANE:

$L, H, \alpha, F = OK$

SZUKAM:

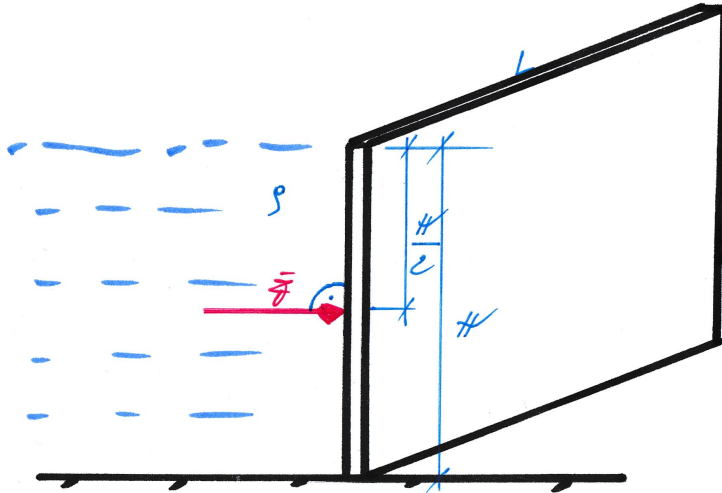
$p(H/2) = ?$

$$p = \frac{F}{A}$$

$$F = 1000 \text{ (N)}$$

$$L = 10 \text{ (m)}$$

$$H = 2 \text{ (m)}$$



$$p = \frac{F}{H \cdot L} = \frac{1000}{2 \cdot 10} = \frac{1000}{20} = 50 \text{ (Pa)}$$

$$p = \frac{F}{A}; F = m \cdot g; S = \frac{m}{\sigma}$$

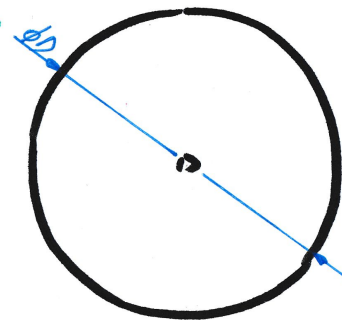
$$p = \frac{F}{A} = \frac{m \cdot g}{A} = \frac{S \cdot \sigma \cdot g}{A} = \frac{S \cdot A \cdot \sigma \cdot g}{A} = S \cdot \sigma \cdot g$$

$$p = \frac{F}{A} = \frac{m \cdot g}{A} = \frac{S \cdot \sigma \cdot g}{A}$$

$$S = \frac{p}{\sigma \cdot g}$$

$$S = \frac{60}{10 \cdot 1} = 6 \text{ (kg/m}^3\text{)}$$

$$\phi D = H = 2 \text{ (m)}$$



$$p = \frac{F}{A}$$

$$A = \pi r^2$$

$$p = \frac{F}{A} = \frac{F}{\pi r^2} = \frac{F}{\pi \left(\frac{D}{2}\right)^2} =$$

$$= \frac{F}{\frac{\pi D^2}{4}} = \frac{4F}{\pi D^2} = \frac{4 \cdot 1000}{3.14 (2)^2} = 318.47 \text{ (Pa)}$$

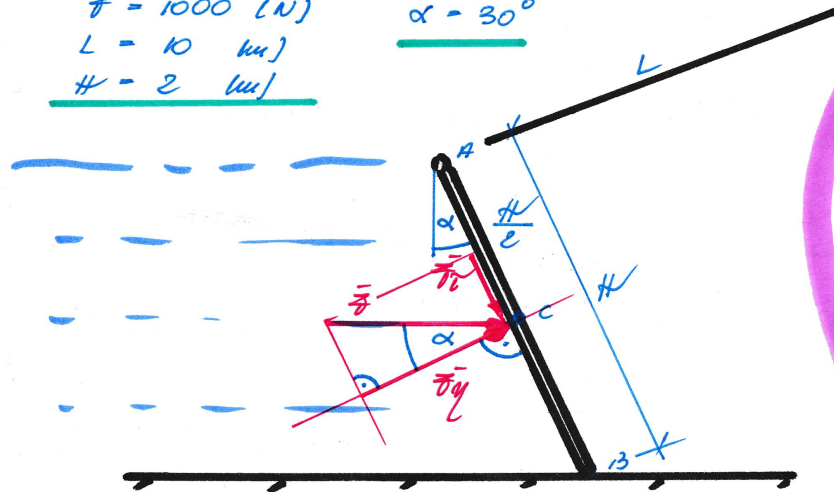
$$1) \underline{p = \frac{\bar{F}}{A}} \quad ; \quad 2) \underline{\bar{F} = m \cdot \bar{g}} \quad ; \quad 3) \underline{S = \frac{m}{\rho}}$$

$$\bar{F} = 1000 \text{ (N)}$$

$$L = 10 \text{ (m)}$$

$$H = 2 \text{ (m)}$$

$$\alpha = 30^\circ$$



$$\underline{p = \frac{\bar{F}_y}{A}}$$

$$\frac{\bar{F}_y}{\bar{F}} = \cos \alpha \implies \bar{F}_y = \bar{F} \cos \alpha$$

$$\frac{\bar{F}_0}{\bar{F}} = \sin \alpha \implies \underline{\bar{F}_0} = \underline{\bar{F} \sin \alpha}$$

$$\begin{aligned} \implies \underline{p} &= \frac{\bar{F}_y}{A} = \frac{\bar{F} \cos \alpha}{H \cdot L} = \frac{1000 \cdot \cos 30^\circ}{2 \cdot 10} \\ &= \frac{1000 \cdot 0,8660}{20} = \underline{43,30 \text{ (Pa)}} \end{aligned}$$

