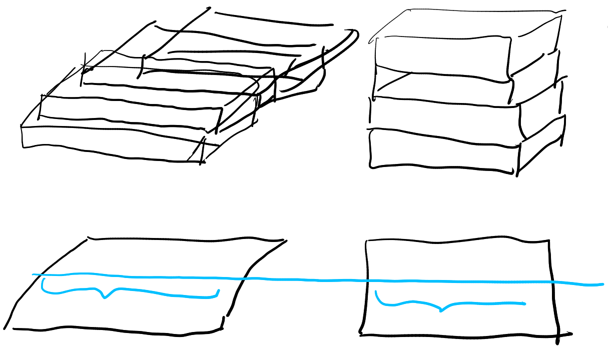
Matematika 2, 13. svibnja 2021.

Cavalierijev princip -- ako su poprečni presjeci iste površine na svakoj visini, onda su tijela koja uspoređujemo istih obujmova

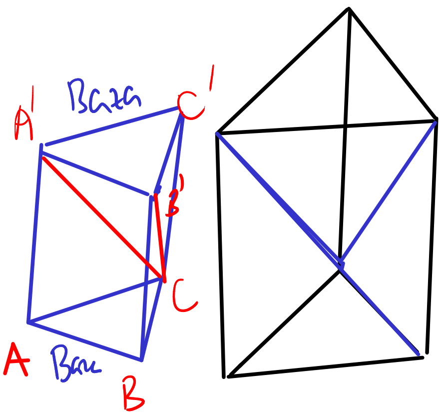


Paralelepiped

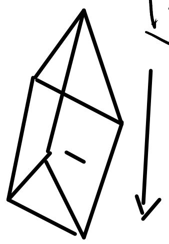
$P_{\square} = B$

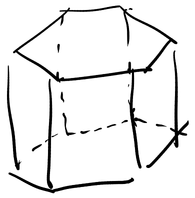
$B \cdot h = V$

$B \cdot c \sin\theta = B c \cos\varphi$



USPRAVNA TROSTRANA PRIZMA





6-STRANA PRIZMA

KOSI VALJAK

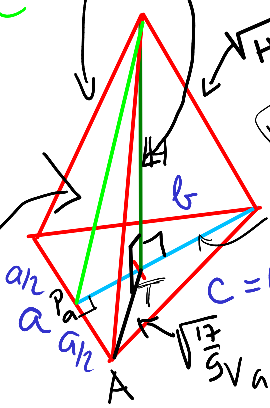
$\triangle ABCA'$

$\triangle A'C'B'C$

$\triangle AA'C'C$

d: $\sqrt{\frac{17}{9} + 25} = \sqrt{\frac{161}{9}}$

Zad. Zadana je piramida s bazom koja je jednakokračni Δ $a = 2$, $b = c = 3$ i visinom $H = 5$. Ako je vrh točno nad težištem, nađi površinu (oplošje) piramide.



$\sqrt{H^2 + \left(\frac{2}{3}v_a\right)^2}$

$\sqrt{25 + \frac{4 \cdot 8}{9}} = \sqrt{\frac{257}{9}}$

$\frac{2}{3}v_a = \frac{2}{3}\sqrt{8} = \frac{4\sqrt{2}}{3}$

$\sqrt{\frac{17}{9}}$ $\quad v_a = \sqrt{8}$

$$V = \frac{1}{3} B \cdot H = \frac{1}{3} \cdot \frac{2}{2}\sqrt{3^2 - \left(\frac{2}{2}\right)^2} \cdot 5$$

$$= \frac{1}{3} 5 \sqrt{8} = \frac{10\sqrt{2}}{3}$$

$2\sqrt{2}$

$P_{plašt} = P_{pobočje}$

$$P = B + 2P_{\Delta} + P_{\Delta_a}$$

$\rightarrow \frac{1}{2}\frac{\sqrt{152}}{3} \cdot 2$

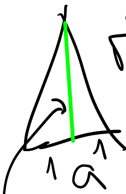
$\sqrt{\frac{161}{9}}$

Heronova fla

$\sqrt{\frac{257}{9}} = \frac{\sqrt{257}}{3}$

$$B = \frac{a \cdot v_a}{2} = \frac{a}{2}\sqrt{b^2 - \left(\frac{a}{2}\right)^2}$$

$$B = \sqrt{8} = 2\sqrt{2}$$



$\frac{\sqrt{161}}{3}$

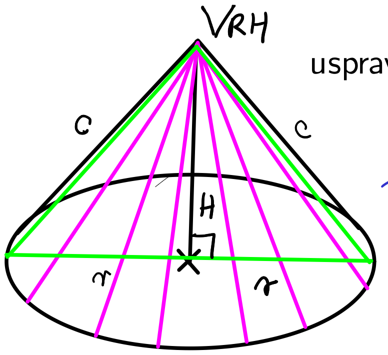
$$\sqrt{\left(\frac{\sqrt{161}}{3}\right)^2 - 1^2}$$

$\Delta P_a A T$

$$\overline{AT} = \sqrt{(a/2)^2 + \left(\frac{1}{3}v_a\right)^2}$$

$$\overline{AT} = \sqrt{1 + \frac{8}{9}} = \frac{\sqrt{17}}{3}$$

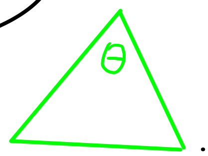
$$= \sqrt{\frac{161 - 9}{9}} = \frac{\sqrt{152}}{3}$$

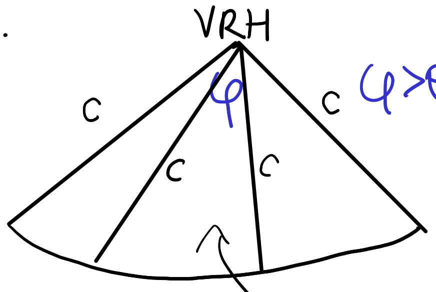


uspravni stožac

$H = 5$

$r = 3$





$\varphi > \theta$

$c = \sqrt{H^2 + r^2}$

KRUŽNI ISJEČAK P_{pob}

$B = ?$ $\quad B = r^2\pi = 9 \times 3.14 = 28.26$

plašt $P_{pob.} = ?$

$P = P_{pob} + B = \underset{3}{r}\,\underset{\sqrt{34}}{c}\,\underset{3.14}{\pi} + \underset{28.26}{r^2\pi} =$

$V = \frac{1}{3} B H = \frac{1}{3}\, 28.26 \times 5 =$

$c = \sqrt{25 + 9} = \sqrt{34}$

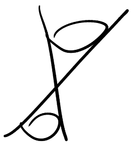
$P_{pob} : c^2\pi = \varphi : 2\pi$

$2r\pi : 2c\pi = \underbrace{\varphi : 2\pi}_{r : c}$

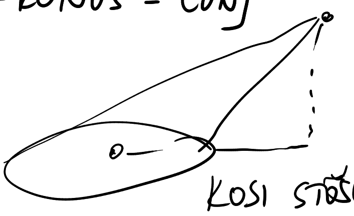
$P_{pob} : c^2\pi = r : c$

$P_{pob} = rc\pi$

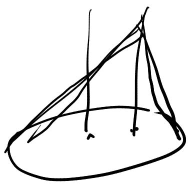
STOŽAC = KONUS = ČUNJ

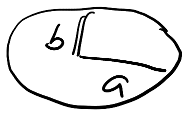


DVOSTRUKI STOŽAC



KOSI STOŠCI





$a \cdot b \cdot \pi = P_{\bigcirc}$