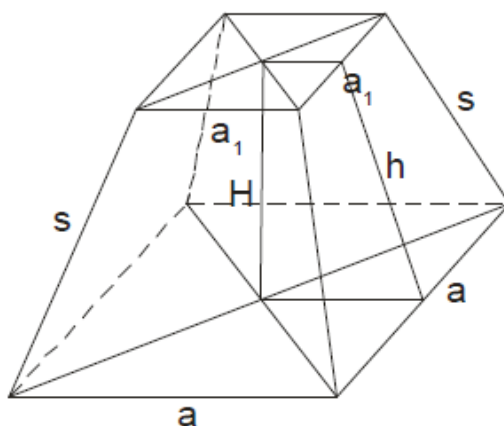


ZARUBLJENA PIRAMIDA

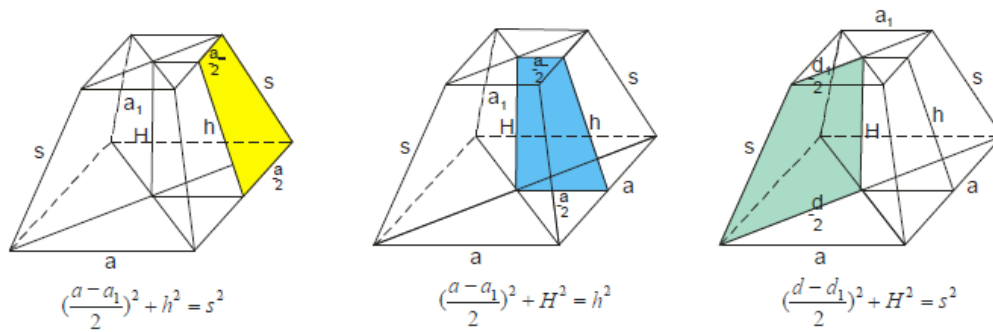
Površina i zapremina

PRAVA PRAVILNA ČETVOROSTRANA ZARUBLJENA PIRAMIDA

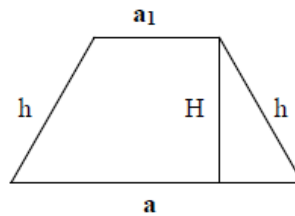


$$\mathbf{P} = B + B_1 + M \quad B = a^2 \quad B_1 = a_1^2 \quad M = 4 \frac{a + a_1}{2} h = 2(a + a_1)h$$

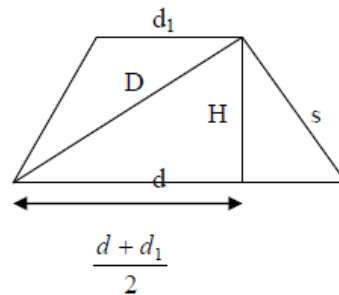
$$V = \frac{H}{3} (B + B_1 + \sqrt{BB_1}) \quad V = \frac{H}{3} (a^2 + a_1^2 + aa_1)$$



osni presek:



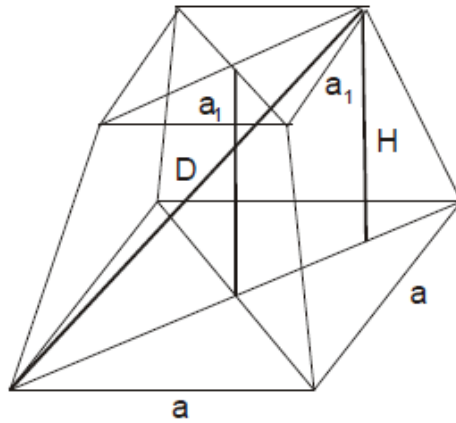
dijagonalni presek:



Zadatak 1

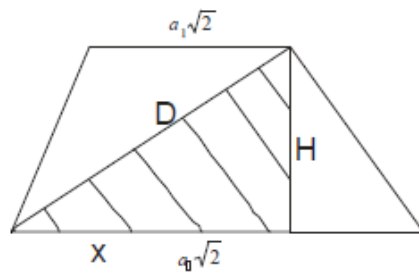
Izračunati zapreminu pravilne četverostrane zarubljene piramide ako su osnovne ivice 7m i 5m i dijagonala 9m.

Rešenje:



$$\begin{array}{l} a = 7m \\ a_1 = 5m \\ D = 9m \\ \hline V = ? \end{array}$$

Da bi našli visinu H moramo uočiti dijagonalni presek.



$$\begin{aligned} x &= \frac{a\sqrt{2} + a_1\sqrt{2}}{2} \\ x &= \frac{7\sqrt{2} + 5\sqrt{2}}{2} \\ x &= 6\sqrt{2}m \end{aligned}$$

$$D^2 = H^2 + x^2$$

$$H^2 = D^2 - x^2$$

$$H^2 = 9^2 - (6\sqrt{2})^2$$

$$H^2 = 81 - 72$$

$$H^2 = 9$$

$$H = 3m$$

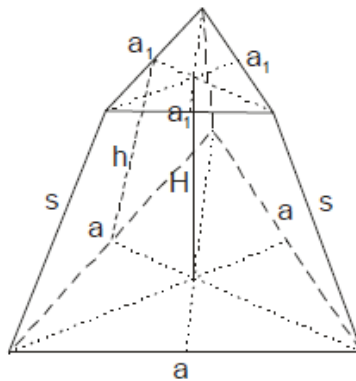
$$V = \frac{H}{3} (B + B_1 + \sqrt{BB_1})$$

$$V = \frac{H}{3} (a^2 + a_1^2 + aa_1)$$

$$V = \frac{3}{3} (7^2 + 5^2 + 7 \cdot 5)$$

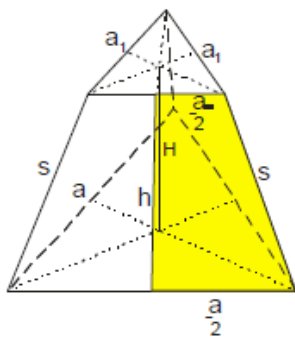
$$V = 109m^3$$

PRAVA PRAVILNA TROSTRANA ZARUBLJENA PIRAMIDA

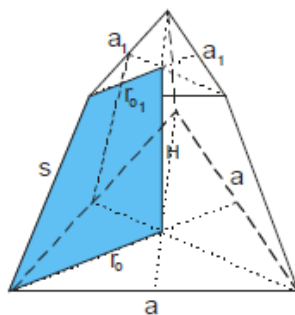


$$P = B + B_1 + M \quad B = \frac{a^2 \sqrt{3}}{4} \quad B_1 = \frac{a_1^2 \sqrt{3}}{4} \quad M = 3 \frac{a + a_1}{2} h$$

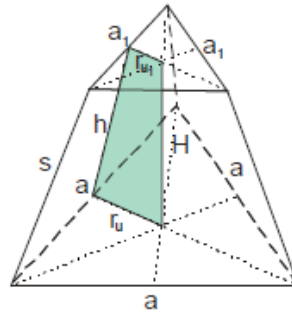
$$V = \frac{H}{3} (B + B_1 + \sqrt{BB_1}) \quad \text{ili} \quad V = \frac{\sqrt{3}H}{12} (a^2 + a_1^2 + aa_1)$$



$$\left(\frac{a-a_1}{2}\right)^2 + h^2 = s^2$$



$$\left(\frac{(a-a_1)\sqrt{3}}{3}\right)^2 + H^2 = s^2$$

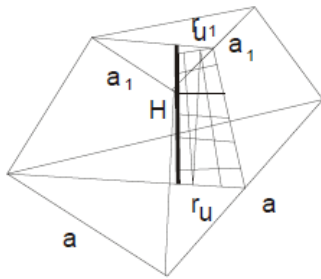


$$\left(\frac{(a-a_1)\sqrt{3}}{6}\right)^2 + H^2 = h^2$$

Zadatak 2

Osnovne ivice pravilne trostrane zarubljene piramide su 2cm i 6cm. Bočna strana nagnuta je prema većoj osnovi pod uglom od 60° . Izračunati zapreminu te piramide.

Rešenje:

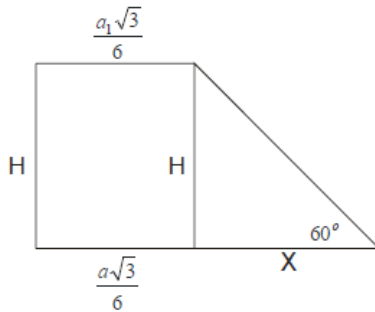


$$a = 6\text{ cm}$$

$$a_1 = 2\text{ cm}$$

PAZI: Kad se u zadatku kaže bočna strana pod nekim uglom, to je ugao između visina bočne strane i visine osnove!

Izvučimo "na stranu" trapez (pravougli)



$$x = \frac{a\sqrt{3}}{6} - \frac{a_1\sqrt{3}}{6} = \frac{6\sqrt{3}}{6} - \frac{2\sqrt{3}}{6} = \frac{4\sqrt{3}}{6} = \frac{2\sqrt{3}}{3}$$

$$\operatorname{tg} 60^\circ = \frac{H}{x} \Rightarrow H = x \cdot \operatorname{tg} 60^\circ = \frac{2\sqrt{3}}{3} \cdot \sqrt{3} = 2\text{ cm}$$

$$V = \frac{2\sqrt{3}}{3} \cdot \frac{1}{4} (6^2 + 2^2 + 6 \cdot 2)$$

$$V = \frac{\sqrt{3}}{6} (36 + 4 + 12)$$

$$V = \frac{\sqrt{3}}{6} \cdot 52$$

$$V = \frac{26\sqrt{3}}{3} \text{ m}^3$$

Ostali zadaci - za domaći:

- Zbirka zadataka zadaci 159, 166, 177
- Udžbenik strane 25 i 25 zadaci 1, 2, 3, 4, 5