

Dečki –ovo su riješeni zadaci s prizmama za vježbu, prepisite ih u bilježnicu i pokušajte samostalno riješiti ,ako ne možete pogledajte rješenja .U zadatcima su i oni zadatci koje ste imali za samostalan rad prethodni sat

Ocjene iz ispravka 6.5.u bilješkama

6

ZADATCI PRIZME

1. Bridovi kvadra odnose se kao 3:2:5, a volumen kvadra je 1920cm^3

Izračunajte oplošje kvadra.

$$a:b:c = 3:2:5$$

$$V = 1920\text{cm}^3$$

$$\frac{a}{3} = \frac{b}{2} = \frac{c}{5} = k$$

$$\frac{a}{3} = k \Rightarrow a = 3k \Rightarrow a = 12\text{cm}$$

$$\frac{b}{2} = k \Rightarrow b = 2k \Rightarrow b = 8\text{cm}$$

$$\frac{c}{5} = k \Rightarrow c = 5k \Rightarrow c = 20\text{cm}$$

$$V = abc = 3k \cdot 2k \cdot 5k = 1920$$

$$30k^3 = 1920$$

$$k^3 = 64$$

$$k = \sqrt[3]{64} = 4$$

$$O = 2(ab + bc + ac) =$$

$$O = 992\text{cm}^2$$

2. Ivan ima tri metalne kocke duljine bridova 2cm , 5cm , 7cm . Želi ih pretopiti u jednu kocku.

Kolika će biti duljina brida nove kocke?.

$$V_1 = a_1^3 = 8\text{cm}^3$$

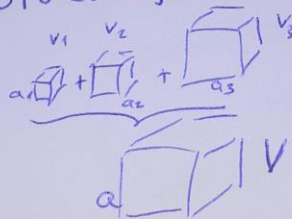
$$V_2 = a_2^3 = 125\text{cm}^3$$

$$V_3 = a_3^3 = 343\text{cm}^3$$

$$V = V_1 + V_2 + V_3 = 476$$

$$V = a^3 = 476$$

$$a = \sqrt[3]{476} = 7,808\text{cm}$$



3. Volumen pravilne šesterostrane prizme je $V = 144\sqrt{3}\text{cm}^3$, a osnovni brid je $a = 4\text{cm}$.

Izračunajte visinu i oplošje prizme.



$$V = 144\sqrt{3}\text{cm}^3$$

$$a = 4\text{cm}$$

$$v, O = ?$$

$$V = \frac{3\sqrt{3}}{2} a^2 v - \text{dajam šesterostr. prizme}$$

$$v = \frac{2V}{3\sqrt{3}a^2} = \frac{2 \cdot 144\sqrt{3}}{3\sqrt{3} \cdot 4^2} = \frac{288}{48} = 6\text{cm}$$

$$O = 3a^2\sqrt{3} + 6av$$

$$O = 3 \cdot 16 \cdot \sqrt{3} + 6 \cdot 4 \cdot 6$$

$$O = 48\sqrt{3} + 144$$

$$O = 48(\sqrt{3} + 3)\text{cm}$$

4. Pravična trostrana prizma ima osnovni brid $a=8\text{cm}$ i površina plašta je $P=48\text{cm}^2$

Izračunajte oplošje i volumen.

$$a = 8\text{cm}$$

$$P_{\text{pl}} = 48\text{cm}^2$$

$$P_{\text{pl}} = 3a \cdot v$$

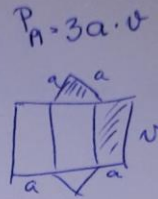
$$48 = 3 \cdot 8 \cdot v$$

$$v = \frac{48}{24} = 2\text{cm}$$

$$O = 2B + P_{\text{pl}} = 2 \cdot \frac{a^2\sqrt{3}}{4} + 3av = \frac{a^2\sqrt{3}}{2} + 3av = \frac{8^2\sqrt{3}}{2} + 48$$

$$= 32\sqrt{3} + 48 = 16(2\sqrt{3} + 3)\text{cm}^2$$

$$V = B \cdot v = \frac{a^2\sqrt{3}}{4} \cdot v = \frac{8^2\sqrt{3}}{4} \cdot 2 = 32\sqrt{3}\text{cm}^3$$



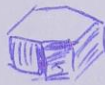
$$B = \frac{a^2\sqrt{3}}{4} \text{ - jednakostranični trokut}$$

5. Kolika je masa željezne matice za vijke oblika šesterostrane prizme osnovnog brida 12mm i debljine 6mm , ako je gustoća željeza $\rho = 7200\text{kg/m}^3$?

$$a = 12\text{mm} = 12 \cdot 10^{-3}\text{m}$$

$$v = 6\text{mm} = 6 \cdot 10^{-3}\text{m}$$

$$\rho = 7200\text{kg/m}^3$$



- šesterostr. prizma.

$$V = B \cdot v = \frac{3a^2\sqrt{3}}{2} \cdot v = \frac{3 \cdot 12^2 \cdot (10^{-3})^2 \cdot \sqrt{3}}{2}$$

$$= 2244 \cdot 10^{-6} \cdot 10^{-3}$$

$$= 2244 \cdot 10^{-9}$$

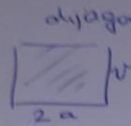
$$= 2.244 \cdot 10^{-6}\text{m}^3$$

$$\rho = \frac{m}{V} \Rightarrow m = \rho \cdot V$$

$$= 0.0161\text{kg}$$

$$= 16.1\text{g}$$

6) Izračunaj oplošje i obujam pravilne šestokotne prizme kojoj je veći dijagonalni presjek kvadrat površine 36 cm^2 .



dijagonalni presjek kvadrat

$$2a = v$$

$$P_{\text{dijagonalni presjek}} = 36$$

$$P_{\text{dijagonalni presjek}} = (2a)^2 = 4a^2$$

$$4a^2 = 36 \quad | :4$$

$$a^2 = 9$$

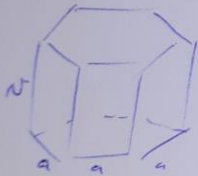
$$\underline{a = 3 \text{ cm}}$$

$$O = 3a^2\sqrt{3} + 6av$$

$$= 27(\sqrt{3} + 4) \text{ cm}^2$$

$$V = \frac{3\sqrt{3}}{2} \cdot a^2 v = 81\sqrt{3} \text{ cm}^3$$

7) Dno bazena ima oblik pravilnog šestokuta. Osnovni brid bazena ima duljinu 2m. Bazeni može primiti 100 hl vode. Izračunajmo visinu bazena.



$$V = 100 \text{ hl}$$

(ponovimo iz fizike mjernu jedinicu)

1 hl = 100 l

100 hl = 10 000 l

1 m³ = 1000 l - ZAŠTO(?)

100 hl = 10 m³

$$\left. \begin{array}{l} a = 2 \text{ m} \\ V = 10 \text{ m}^3 \end{array} \right\}$$

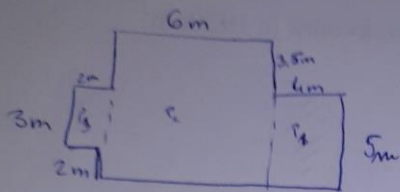
$$V = \frac{3a^2 v \sqrt{3}}{2} \Rightarrow$$

$$v = \frac{2V}{3a^2\sqrt{3}} \quad \text{ili}$$

$$10 = \frac{3 \cdot 2^2 \cdot v \sqrt{3}}{2}$$

$$\underline{v = \frac{5\sqrt{3}}{9} \text{ m}} = \dots \text{ m}$$

8. Koliki je volumen stana čiji je tloost na slici, i čija je visina 2.3m



$$V = \underbrace{\left(4 \cdot 5 + 6 \cdot 3.5 + 3 \cdot 2 \right)}_{\text{površina baze}} \cdot \underbrace{2.3}_{\text{visina}} = 21.3$$

$$V = 177.1 \text{ m}^3$$

9. Oplošje uspravne trostrane prizme je 1440 cm^2 , a njezina visina 16cm. Izračunaj osnovne bridove prizme ako se oni odnose kao 17:10:9.

- baza je raznostraničan trokut $\Rightarrow a:b:c = 17:10:9$

$$O = 2B + (a+b+c) \cdot h$$

$$B = \sqrt{s(s-a)(s-b)(s-c)}$$

$$s = \frac{a+b+c}{2} = \frac{36k}{2} = 18k$$

$$a+b+c = 36k$$

$$B = \sqrt{18k(18k-17k)(18k-10k)(18k-9k)} = \sqrt{1296k^4} = 36k^2$$

$$\frac{a}{k} = 17 \Rightarrow a = 17k$$

$$\frac{b}{k} = 10 \Rightarrow b = 10k$$

$$\frac{c}{k} = 9 \Rightarrow c = 9k$$

$$1440 = 2 \cdot 36k^2 + 36k^2 \cdot 16$$

$$1440 = 72k^2 + 576k^2 \quad | : 72$$

$$20 = k^2 + 8k$$

$$k^2 + 8k - 20 = 0$$

$$k_{1,2} = \frac{-8 \pm \sqrt{64 + 80}}{2} = \frac{-8 \pm \sqrt{144}}{2} = \frac{-8 \pm 12}{2}$$

$$k_{1,2} = \begin{matrix} -4 + 6 & k_1 = 10 \notin \mathbb{N} \\ -4 - 6 & k_2 = 2 \end{matrix}$$

$$a_1 = 34 \text{ cm}$$

$$b = 20 \text{ cm}$$

$$c = 18 \text{ cm}$$