

SRIJEDA, 20.5.2020. 8.e

Dobar dan,

prilažem rješenja jučerašnje zadaće.

Pred vama je vježba (kviz) za pisanu provjeru. Imao/la bi 60 minuta. Provjeri samog/samu sebe i vidi kako stojiš sa svojim znanjem. Svojim, ne tuđim!!! Ovo je vježba.

Može se rješavati samo jednom. Obavezna je! Otvorena je od 9 do 16 sati 20.5.2020.

Napiši samo kratke odgovore bez postupaka.

ind: za vježbu riješi kao i ostali

Sastanak na **zoom-u** je u **12:30**.

Pozdrav

<https://forms.office.com/Pages/ResponsePage.aspx?id=FvJamzTGgEurAgyaPQKQka9gUnltaLdLqbvUmbRz--xUN0JUUKFCMjQ2UFhLODFGUjg3QUxQMVZPWC4u>

Ponavljanje prizme i piramide

1. Izračunaj oplošje, obujam te duljinu prostorne dijagonale kocke kojoj brid ima duljinu $2\sqrt{3} \text{ cm}$.

$$a = 2\sqrt{3} \text{ cm}$$

O, V, D

$$O = 6a^2 = 6 \cdot (2\sqrt{3})^2 = 6 \cdot 4 \cdot 3$$

$$O = 72 \text{ cm}^2$$

$$V = a^3$$

$$V = 2\sqrt{3} \cdot 2\sqrt{3} \cdot 2\sqrt{3}$$

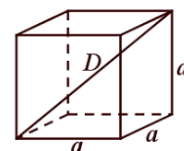
$$V = 4 \cdot 3 \cdot 2\sqrt{3}$$

$$V = 24\sqrt{3} \text{ cm}^3$$

$$D = a\sqrt{3}$$

$$D = 2\sqrt{3} \cdot \sqrt{3}$$

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



2. Odredi oplošje i obujam kvadra kojemu su duljine bridova 3cm, 0.5 dm i 0.9 m. Može li se u taj kvadar naliti 1 litra vode (kada bi bio šupalj)?

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

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

$$V = abc$$

$$b = 5 \text{ cm}$$

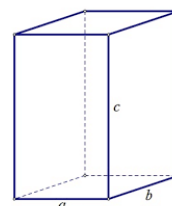
$$O = 1470 \text{ cm}^2$$

$$V = 1350 \text{ cm}^3 = 1.35 \text{ dm}^3 = 1.35 \text{ l}$$

$$c = 90 \text{ cm}$$

O=?

Može se uliti 1 l vode.



3. Izračunaj oplošje pravilne trostrane prizme kojoj je osnovni brid duljine 5 cm, a obujam $\frac{25\sqrt{3}}{2} \text{ cm}^3$.

$$a = 5 \text{ cm}$$

$$B = \frac{a^2\sqrt{3}}{4}$$

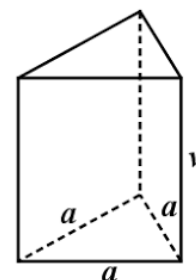
$$P = 3av = 30 \text{ cm}^2$$

$$V = \frac{25\sqrt{3}}{2} \text{ cm}^3$$

$$B = \frac{25\sqrt{3}}{4} \text{ cm}^2,$$

O=?

$$V = Bv \rightarrow v = \frac{V}{B} = \frac{\frac{25\sqrt{3}}{2}}{\frac{25\sqrt{3}}{4}} = \frac{25\sqrt{3} \cdot 4}{25\sqrt{3} \cdot 2} = 2, \quad v = 2 \text{ cm}$$



$$O=2B+P$$

$$O=2 \cdot \frac{25\sqrt{3}}{4} \text{ cm}^2 + 30 \text{ cm}^2 = (12.5\sqrt{3}+30) \text{ cm}^2$$

4. Izračunaj duljinu bridova kvadra ako je zadana duljina prostorne dijagonale duljine 15 cm i omjer duljina bridova a:b:c=3:4:5.

$$a:b:c=3:4:5 \rightarrow a=3k, b=4k, c=5k$$

$$D=15 \text{ cm}$$

a,b,c

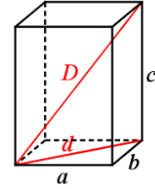
$$D^2=a^2+b^2+c^2$$

$$15^2=(3k)^2 + (4k)^2 + (5k)^2 = 9k^2 + 16k^2 + 25k^2 = 50k^2$$

$$225=50k^2$$

$$k^2 = \frac{225}{50} / \sqrt{\quad}$$

$$k = \frac{3\sqrt{2}}{2} \dots a=3k = \frac{9\sqrt{2}}{2} \text{ cm} \quad b=4k = 4 \cdot \frac{3\sqrt{2}}{2} \text{ cm} = 6\sqrt{2} \text{ cm} \quad c=5k = \frac{15\sqrt{2}}{2} \text{ cm}$$



5. Opseg baze pravilne šesterostrane prizme iznosi 36 cm, a obujam $540\sqrt{3} \text{ cm}^3$. Odredi oplošje prizme.

$$o_B=36 \text{ cm} \rightarrow a = 6 \text{ cm}$$

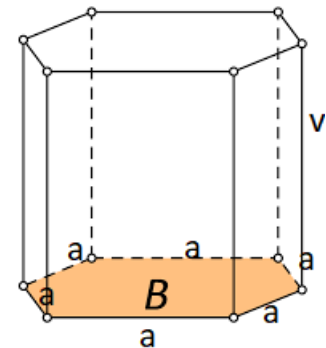
$$V=540\sqrt{3} \text{ cm}^3$$

$$O=?$$

$$B=6 \cdot \frac{a^2\sqrt{3}}{4} = 54\sqrt{3} \text{ cm}^2$$

$$V=Bv \rightarrow v = \frac{V}{B} = \frac{540\sqrt{3} \text{ cm}^3}{54\sqrt{3} \text{ cm}^2} = 10 \text{ cm} \quad P=6av=360 \text{ cm}^2$$

$$O=2B+P \quad O=(108\sqrt{3} + 360) \text{ cm}^2$$



6. Odredi obujam kvadratne prizme kojoj je površina pobočja 140 cm^2 , a površina baze 25 cm^2 .

$$P=140 \text{ cm}^2$$

$$P=4av$$

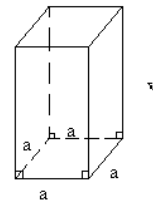
$$B=25 \text{ cm}^2 \rightarrow B=a^2, 25 = a^2 \rightarrow a=5 \text{ cm} \quad 140=4 \cdot 5 \cdot v$$

$$a=?, v=?, V=?$$

$$v=7 \text{ cm}$$

$$V=Bv$$

$$V=25 \cdot 7 \text{ cm}^3 = 175 \text{ cm}^3$$



7. Površina pobočja pravilne četverostrane piramide je 320 cm^2 , a duljina visine pobočke je 10 cm. Izračunaj oplošje i obujam piramide.

$$P=320 \text{ cm}^2$$

$$v_1=10 \text{ cm}$$

$$O=?, V=?$$

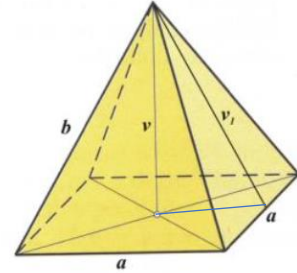
$$P=4 \frac{av_1}{2} \rightarrow 320=2 \cdot a \cdot 10 \rightarrow a=16 \text{ cm}, \quad B=a^2=256 \text{ cm}^2$$

$$O=B+P = 576 \text{ cm}^2$$

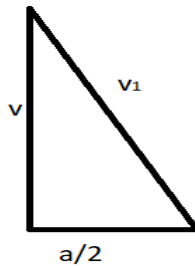
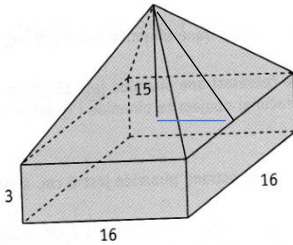
$$V=\frac{Bv}{3}$$

$$v=\sqrt{v_1^2 - \left(\frac{a}{2}\right)^2} = 6 \text{ cm}$$

$$V=512 \text{ cm}^3$$



8. Izračunaj oplošje i obujam nacrnanog tijela (napomena: oplošje je zbroj površina ploha koje omeđuju neko geometrijsko tijelo, dakle one koje se ne vide ne ubrajaš).



$$v_1 = \sqrt{v^2 + \left(\frac{a}{2}\right)^2} = \sqrt{15^2 + \left(\frac{16}{2}\right)^2} = 17$$

$$O=16^2+4 \cdot 3 \cdot 16 + 4 \cdot \frac{16 \cdot 17}{2} = 992$$

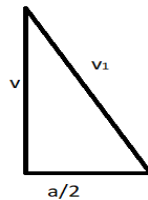
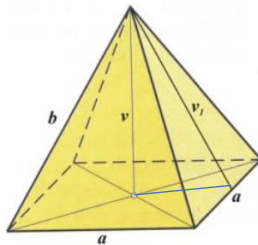
$$V=V_1+V_2=16 \cdot 16 \cdot 3 + (16 \cdot 16 \cdot 15):3 = 768 + 1280 = 2048$$

9. Koliko platna treba za šator (šator nema dno!) u obliku pravilne četverostrane piramide čiji je osnovni brid dug 3 m, a duljina visine piramide iznosi 5 m?

$$a=3 \text{ m}$$

$$v=5 \text{ m}$$

$$P=?$$



$$v_1 = \sqrt{v^2 + \left(\frac{a}{2}\right)^2} = \frac{\sqrt{109}}{2} \approx 5.22 \text{ m}$$

$$P=4 \cdot \frac{av_1}{2} = 2av_1 = 31.32 \text{ m}^2$$

Potrebno je približno 31.22 m² platna.

10. Nezašiljena olovka ima oblik pravilne šesterostrane prizme. Duljina olovke iznosi 16 cm, a duljina brida baze 4 mm. Koliko je drva potrebno za izradu 100 takvih olovaka? Zanemari grafitni uložak.

$$v=16 \text{ cm}$$

$$V=Bv$$

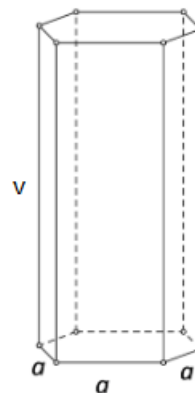
$$a=4 \text{ mm}$$

$$V=6 \cdot \frac{a^2\sqrt{3}}{4} v$$

$$V=?$$

$$V=3840\sqrt{3} \text{ mm}^3$$

Za 100 olovaka potrebno je $38400\sqrt{3} \text{ mm}^3$ drva, tj. 66.51 cm^3 .



11. Koliko se boca od jedne litre može napuniti iz posude koja ima oblik pravilne trostrane prizme ako je duljina njezina osnovnog brida 40 cm, a duljina visine $\frac{1}{3} \text{ m}$?

$$a=40 \text{ cm} = 4 \text{ dm}$$

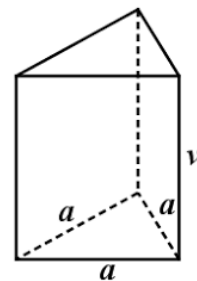
$$V=Bv$$

$$v=\frac{1}{3} \text{ m} = \frac{10}{3} \text{ dm}$$

$$V=\frac{a^2\sqrt{3}}{4} v$$

$$V=?$$

$$V=\frac{16\sqrt{3}}{4} \cdot \frac{10}{3} \text{ dm}^3 = \frac{40\sqrt{3}}{3} \text{ dm}^3 \approx 23.09 \text{ l}$$



Može se napuniti 23 boce od jedne litre.

12. Poklon oblika kvadra potrebno je omotati ukrasnim papirom. Koliko je papira potrebno ako su dimenzije poklona 45 cm x 0.5m x 0.3 m?

$$a=45 \text{ cm}$$

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

$$b= 50 \text{ cm}$$

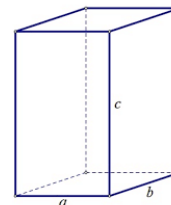
$$O= 10\ 200 \text{ cm}^2=102 \text{ dm}^2=1.02 \text{ m}^2$$

$$c=30 \text{ cm}$$

Za omatanje poklona potrebno je

$$O=?$$

najmanje 1.02 m^2 ukrasnog papira.



13. Akvarij oblika kocke duljine brida 60 cm. Koliko litra vode se najviše može naliti u njega?

$$a=60 \text{ cm} = 6 \text{ dm}$$

$$V= 216 \text{ dm}^3= 216 \text{ l}$$

$$V=?$$

U akvarij se može najviše uliti

$$V=a^3$$

216 litra vode.



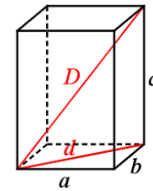
14. Može li se olovka duga 14 cm spremiti u kutiju oblika kvadra čije su dimenzije 9 cm, 8cm i 7 cm?

$$a=9 \text{ cm}, b=8 \text{ cm}, c= 7 \text{ cm}$$

$$D=?$$

$$D=\sqrt{a^2 + b^2 + c^2}$$

$$D=\sqrt{194} \text{ cm} \approx 13.93 \text{ cm} < 14 \text{ cm}$$



Olovka duljine 14 cm ne može se spremiti u ovakav kvadar.

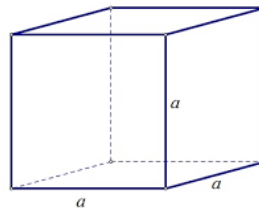
15. Oplošje kocke iznosi 150 cm^2 . Izračunaj obujam kocke čiji je brid dulji za 2 cm.

$$O=6a^2$$

$$150=6a^2 \Rightarrow a^2=25 \Rightarrow a = 5 \text{ cm}$$

$$a_1=7 \text{ cm}$$

$$V_1=a_1^3=343 \text{ cm}^3$$



DODATNI ZADATAK (+2BODA)

Baza uspravne prizme je jednakokrani trokut s osnovicom duljine 16 cm i krakom duljine 17 cm. Izračunaj oplošje te prizme ako je duljina visine prizme jednaka duljini visine na osnovicu baze.

$$a=16 \text{ cm}$$

$$b=17 \text{ cm}$$

$$v= v_a$$

$$O=?$$

$$v= v_a= \sqrt{b^2 - \left(\frac{a}{2}\right)^2} = 15$$

$$v=15 \text{ cm}$$

$$B= \frac{av_a}{2} = 120 \text{ cm}^2$$

$$P=av+2bv$$

$$P=750 \text{ cm}^2$$

$$O=870 \text{ cm}^2$$

