

1. [4] Odredi obujam uspravnog valjka ako površina baze iznosi $200\pi \text{ cm}^2$, a oplošje $600\pi \text{ cm}^2$. Poluprijer baze iznosi 26 cm.

Rj:

$$B = 200\pi \text{ cm}^2$$

$$O = 600\pi \text{ cm}^2$$

$$r = 26 \text{ cm}$$

$$V = ?$$

$$V = B \cdot h$$

$$O = 2B + P$$

$$P = O - 2B = 200\pi \text{ cm}^2 \quad (1)$$

$$P = 2rh\pi$$

$$h = \frac{P}{2r\pi} = 3.84615 \text{ cm} \quad (1)$$

$$V = 769.2 \cdot \pi \text{ cm}^3 \quad (1)$$

2. [5] Iz srebrne kocke brida 20 cm treba istokariti valjak kojemu su osnovke upisane stranama kocke. Koliki će biti ostatak srebra ako je gustoća srebra 10500 kg/m^3 ?

Rj:

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

$$\rho(\text{Ag}) = 10500 \text{ kg/m}^3$$

$$\Delta V = V(\text{kvadrat}) - V(\text{valjak}) \quad (1)$$

$$r(\text{valjak}) = \frac{a}{2} = 10 \text{ cm}$$

$$h(\text{valjak}) = 20 \text{ cm} \quad (1)$$

$$O = r^2 \pi (r+s) = 398,024 \quad (1)$$

550 Odredi opseg i površinu osnovnog presjeka stošca čija visina iznosi 15 cm, a polumjer baze iznosi 8 cm.

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

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

$$P(\text{op}) = ?$$

$$O(\text{op}) = ?$$

$$s^2 = h^2 + r^2 = 232 \quad \sqrt{\quad} \quad (1)$$

$$s = 2\sqrt{58} \quad (1)$$

$$d = 2r = 16 \text{ cm} \quad (1)$$

$$P(\text{op}) = \frac{d \cdot h}{2} = 120 \text{ cm}^2, \quad (1)$$

$$O(\text{op}) = d + 2s = 16 + 4\sqrt{58} \quad (1)$$

IESI

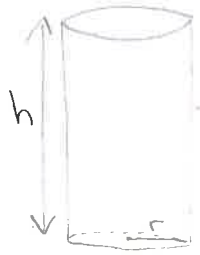
1. Oplasje valjka je $112\pi \text{ cm}^2$. Duljine polupjera i visine su u omjeru 2:5.

Koliki je obujam valjka?

$$O = 112\pi \text{ cm}^2$$

$$r:h = 2:5$$

$$V = ?$$



$$B = r^2\pi h$$

$$O = 2B + P = 2r\pi(r+h)$$

$$V = B \cdot h = r^2\pi h$$

$$2r\pi(r+h) = 112\pi \quad /: \pi \quad (+1)$$

$$2r(r+h) = 112 \quad /: 2$$

$$r(r+h) = 56$$

$$\frac{r}{h} = \frac{2}{5} \Rightarrow r = \frac{2}{5}h \quad (+1)$$

$$\frac{2}{5}h \left(\frac{2}{5}h + h \right) = 56$$

$$\frac{2}{5}h \left(\frac{2}{5}h + \frac{h}{1} \right) = 56$$

$$\frac{2}{5}h \left(\frac{2}{5}h + \frac{5 \cdot h}{5 \cdot 1} \right) = 56$$

$$\frac{2}{5}h \left(\frac{2}{5}h + \frac{5h}{5} \right) = 56$$

$$\frac{2}{5}h \left(\frac{2h+5h}{5} \right) = 56$$

$$\frac{2}{5}h \left(\frac{7h}{5} \right) = 56$$

$$\frac{14}{25}h^2 = 56 \quad /: \frac{25}{14}$$

$$\frac{25}{14} \cdot \frac{14}{25} h^2 = \frac{25}{14} \cdot 56$$

$$\frac{1}{14} \cdot 14 h^2 = \frac{25}{14} \cdot 56 \quad \begin{matrix} 56:14=4 \\ 14:14=1 \end{matrix}$$

$$h^2 = 25 \cdot 4$$

$$h^2 = 100 \quad \sqrt{\quad}$$

$$h_1 = +10 \quad (+1)$$

$$h_2 = -10$$

$$V = r^2\pi \cdot h$$

$$V = 4^2\pi \cdot 10$$

$$V = 16\pi \cdot 10$$

$$V = 160\pi \text{ cm}^3 \quad (+1)$$

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4. Površina plešta uspravnog stošca je $60\pi \text{ cm}^2$ a dužine polupjera osnovke i visine stošca u omjeru su 3:4. Koliki je obujam stošca?

$$P = 60\pi \text{ cm}^2$$

$$r:h = 3:4 \rightarrow \begin{cases} r = 3k \\ h = 4k \end{cases} \quad / \cdot 2$$

$$O = ?$$



$$P = r\pi s \quad (+1)$$

$$V = \frac{r^2\pi h}{3}$$

$$r = 6$$

$$h = 8$$

$$S = \sqrt{r^2 + h^2} \quad (+1)$$

$$S = \sqrt{9k^2 + 16k^2}$$

$$S = \sqrt{25k^2}$$

$$S = 5k$$

$$60\pi = 3k\pi \cdot 5k$$

$$60 = 15k^2 \quad / :15$$

$$k^2 = 4 \quad / \sqrt{\quad}$$

$$k = 2 \quad (+1)$$

$$V = \frac{36\pi \cdot 8}{3} = 96\pi \text{ cm}^3 \quad (+1)$$

5. Osnovka uspravne prizme je trokut sa stranicama dužina 8, 9, i 11 cm. Visina prizme jednaka je najvećoj visini osnovke. Koliki je obujam prizme?

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

$$b = 9 \text{ cm}$$

$$c = 11 \text{ cm}$$

$h = h_a \Rightarrow$ najveća visina osnovke

$$V = B \cdot h$$

$$s = \frac{a+b+c}{2} \quad (+1)$$

$$B = \sqrt{s(s-a)(s-b)(s-c)} \quad (+1) = 14 \text{ cm}$$

$$B = \sqrt{14 \cdot 6 \cdot 5 \cdot 3}$$

$$B = 6\sqrt{35} \text{ cm}^2$$

$$V = 6\sqrt{35} \cdot \frac{3\sqrt{35}}{2}$$

$$V = 315 \text{ cm}^3 \quad (+1)$$

$$B = \frac{a \cdot h_a}{2} \quad / \cdot 2 \Rightarrow 2B = a \cdot h_a$$

$$h_a = \frac{2B}{a}$$

$$= \frac{3\sqrt{35}}{2} \text{ cm}$$

Test, prizma i piramida

ENVA Ljubitiš 2.1

1) Duzine bokova kvadrata L za u omjer 4:5:9, a volumen je 3692 cm^3 . Koliko mu je oplasje?

13/13
5

$$a:b:c = 4:5:9$$

$$V = 3692 \text{ cm}^3$$

$$O = ?$$

$$a = 4k$$

$$b = 5k$$

$$c = 9k$$

$$V = abc$$

$$3692 = 4k \cdot 5k \cdot 9k$$

$$3692 = 180k^3$$

$$k = 2,98 \quad (1)$$

$$a = 11,92 \text{ cm}$$

$$b = 14,9 \text{ cm}$$

$$c = 26,82 \text{ cm}$$

$$O = 2(ab + ac + bc) = 1793,84 \text{ cm}^2 \quad (1)$$

2) Kocka ima duzinu brida 9 cm. Presjecena je ravninom koja prolazi dijagonalom baze i nasuprotnim vrhom. Volumen=?

$$a = 9 \text{ cm}$$

$$V = ?$$

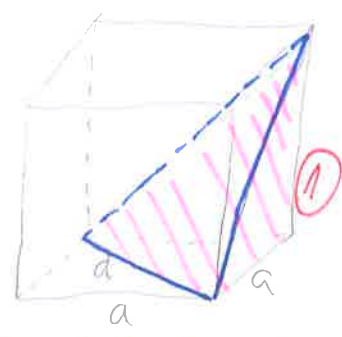
$$V = \frac{1}{3} Bh$$

$$B = \frac{a^2}{2}$$

$$B = \frac{9^2}{2}$$

$$B = 40,5 \text{ cm}^2$$

$$h = a = 9 \text{ cm}$$

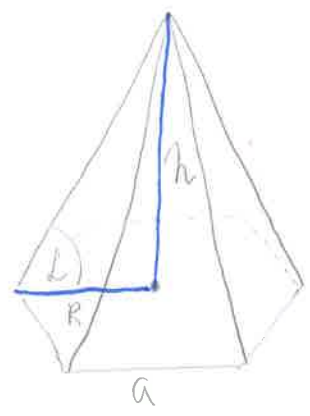


$$V = \frac{1}{3} Bh$$

$$V = 121,5 \text{ cm}^3 \quad (1)$$



3) Obujam pravilne šestostrane prizme je 300 cm^3 . Visina je 10 cm. Koliki je kut između poloynog brida i baze?



$$a = R$$

$$V = 300 \text{ cm}^3$$

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

$$L = ?$$

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

$$B = \frac{3V}{h}$$

$$B = 90 \text{ cm}^2$$

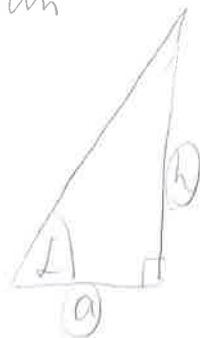
$$B = \frac{3\sqrt{3}}{2} a^2$$

$$a^2 = \frac{2B}{3\sqrt{3}} \quad (1)$$

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

$$\text{tg } L = \frac{h}{a}$$

$$L = 57^\circ 59' \quad (1)$$



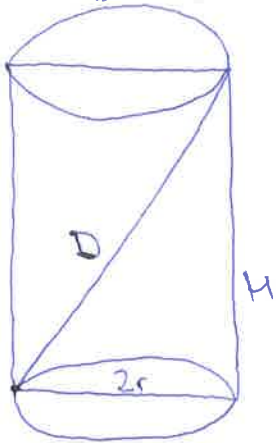
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TEST

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VALJAK

1. Visina valjka je 8cm. Izračunaj površinu i volumen valjka ako je dijagonala osnog presjeka valjka 10cm



$$H = 8 \text{ cm}, D = 10 \text{ cm}, P, V = ?$$

$$D^2 = (2r)^2 + H^2$$

$$10^2 = (2r)^2 + 8^2$$

$$(2r)^2 = 100 - 64$$

$$2r = \sqrt{36}$$

$$2r = 6$$

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

$$B = r^2 \pi$$

$$B = 3^2 \pi$$

$$B = 9\pi \text{ cm}^2$$

$$M = 2r\pi H$$

$$M = 2 \cdot 3\pi \cdot 8$$

$$M = 48\pi \text{ cm}^2$$

$$P = 2B + M$$

$$P = 2 \cdot 9\pi + 48\pi$$

$$P = 18\pi + 48\pi$$

$$P = 66\pi \text{ cm}^2$$

$$V = B \cdot H$$

$$V = 9\pi \cdot 8$$

$$V = 72\pi \text{ cm}^3$$

2. Zadana je uspravna trostrana prizma visine 5m i površine

$P_1 = 40$, $P_2 = 29.49$, $P_3 = 29.88$. Odradi oplošje i volumen prizme.

a $P_1 = 40$

a $P_2 = 29.49$

b $P_3 = 29.88$

$h = 5$

$$P_1 = c \cdot h$$

$$c = \frac{P_1}{h} = \frac{40}{5} = 8$$

$$a = \frac{P_2}{h} = \frac{29.49}{5} = 5.89$$

$$b = \frac{P_3}{h} = \frac{29.88}{5} = 5.97$$

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

$$s = 9.93$$

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

$$= \sqrt{9.93(9.93-5.89)(9.93-5.97)(9.93-8)}$$

$$= 17.51$$

$$O = 2B + P$$

$$= 2 \cdot 17.51 + (40 + 29.49 + 29.88)$$

$$= 134.39$$

$$V = B \cdot h$$

$$= 17.51 \cdot 5 = 87.55$$

OPSEG OSNOVKE KVADRATA JE 0, DALJINA ISKONOG BRIVA IZNOCI C, A

PROSTORNE DIJAGONALE D:

IZRACUNAJ OBRUŠE I OBUJAM KVADRA

$$O = 12$$

$$C = 3$$

$$D = 5,39$$

$$O, V = ?$$

$$D = 5,39$$

$$\sqrt{a^2 + b^2 + c^2} = 5,39 / ^2$$

$$a + b^2 + c^2 = 29$$

$$2(a+b) = 12 \Rightarrow a+b = 6 \Rightarrow a = 6 - b$$

$$c = 3$$

$$a^2 + b^2 + c^2 = 29$$

$$a^2 + b^2 + c^2 = 29$$

$$(b-6)^2 + b^2 + 3^2 = 29$$

$$b_1 = 2 \rightarrow a_1 = 4$$

$$b_2 = 4 \rightarrow a_2 = 2$$

$$\begin{aligned} O &= 2B + P \\ &= 2a \cdot b + 4c \\ &= 2 \cdot 4 \cdot 2 + 12 \cdot 3 \\ &= 52 \end{aligned}$$

$$\begin{aligned} V &= B \cdot h \\ &= a \cdot b \cdot h \\ &= 24 \end{aligned}$$

STOŽAC: Izračunaj opseg i površinu osnovnog presjeka stošca ako je zadano:

[4] $h = 15 \text{ cm}$
 $r = 0,8 \text{ dm} = 8 \text{ cm}$

$P_{op} = ?$, $O_{op} = ?$
 $s^2 = h^2 + r^2$
 $s^2 = 15^2 + 8^2$
 $s = 17 \text{ cm}$

$d = 2r$
 $d = 2 \cdot 8$
 $d = 16 \text{ cm}$

$P_{op} = \frac{d \cdot h}{2}$
 $P_{op} = 120 \text{ cm}^2$

$O_{op} = d + 2s$
 $O_{op} = 50 \text{ cm}$