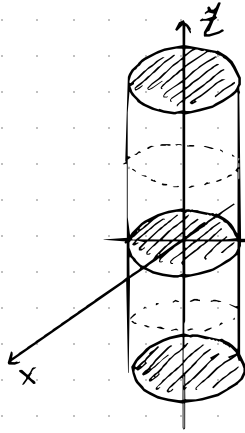


CILINDRIČNE PLOHE ("tali jedna varijabla")

Pc.) a) $x^2 + y^2 = 4$

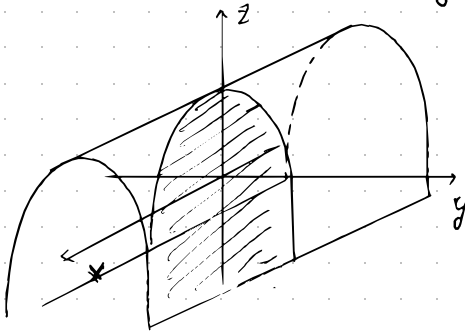


→ nemamo z što znači da je
dež oblika na z kružnica

KRUŽNI CILINDAR

b) $y^2 + z = 2$

→ razvučena po x osi
jer nemamo x

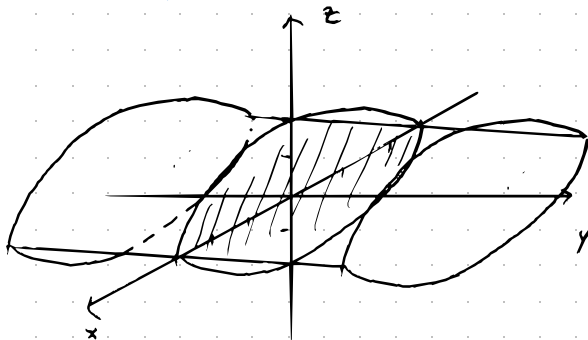


PARABOLIČNI
CILINDAR

c) $4x^2 + 9z^2 = 36$

$$\frac{x^2}{9} + \frac{z^2}{4} = 1$$

\downarrow \downarrow
3 2



KONUSNE (STOŽASTE) PLOHA

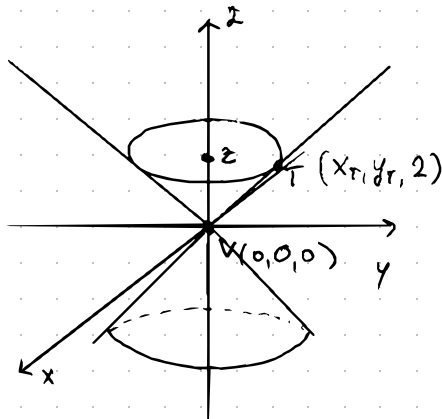
→ moramo znati izvesti jednačice

M1 2023 (1.)

vrh $(0,0)$

$$x^2 + y^2 = 3$$

u ravni $z=2$



KRUŽNI
STOŽAC

Kanonska jednačina:

$$\frac{x-x_v}{x_T-x_v} = \frac{y-y_v}{y_T-y_v} = \frac{z-z_v}{z_T-z_v}$$

$$\frac{x-0}{x_T-0} = \frac{y-0}{y_T-0} = \frac{z-0}{2-0}$$

$$\frac{x}{x_T} = \frac{y}{y_T} = \frac{z}{2}$$

$$x_T = \frac{x y_T}{y} \rightarrow y_T = \frac{2y}{z}$$

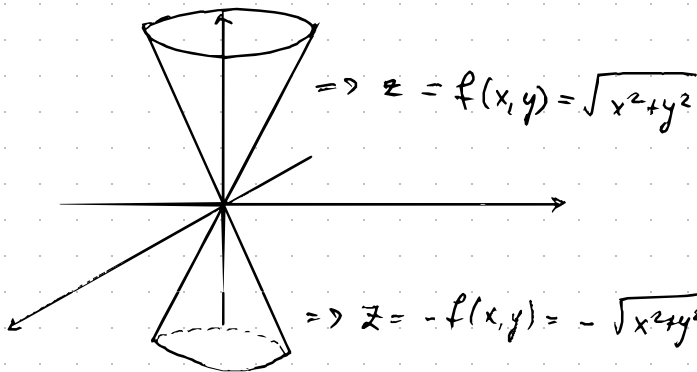
$$x_T = \frac{x}{y} \cdot \frac{2y}{z} = \frac{2x}{z}$$

$$x_T^2 + y_T^2 = 3$$

$$\frac{4x^2}{z^2} + \frac{4y^2}{z^2} = 3 \cdot z^2$$

$$4x^2 + 4y^2 = 3z^2$$

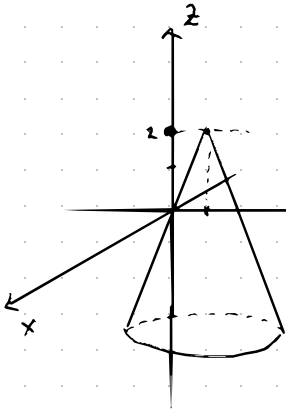
P.r.) jednačicu stožca su definirane
dvije varijable (dajmo i gornju stranu stožca)



xseti se kako
dobijemo brzinu

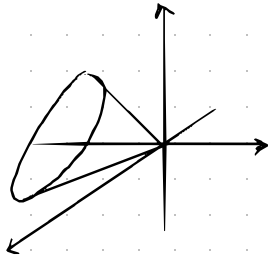
↳ dvije funkcije
polukona

$$b) z = 2 - \sqrt{x^2 + (y-1)^2}$$

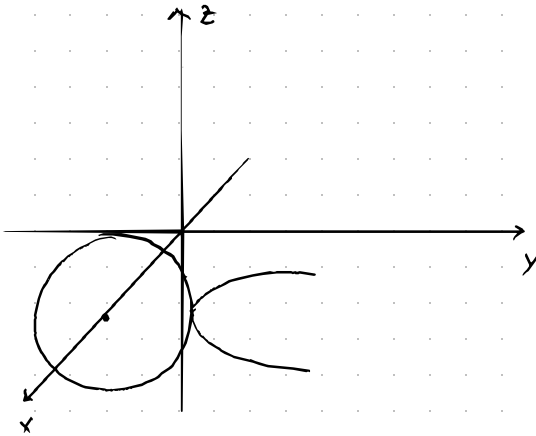


dolja polovica
brežnog
stožca

$$c) y = -\sqrt{4x^2 + 9z^2}$$



ROTACIJSKE PLOHE



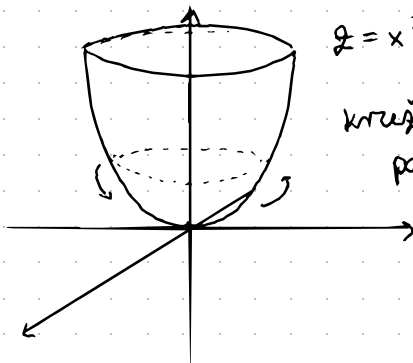
$$F(x, \pm\sqrt{y^2+z^2}) = 0$$

$P_i) y = 3 + (x-z)^2$

$$y - 3 - (x-z)^2 = 0$$

$$\pm\sqrt{y^2+z^2} - 3 - (x-z)^2 = 0$$

$P_c) a) z = y^2$ oko osi z



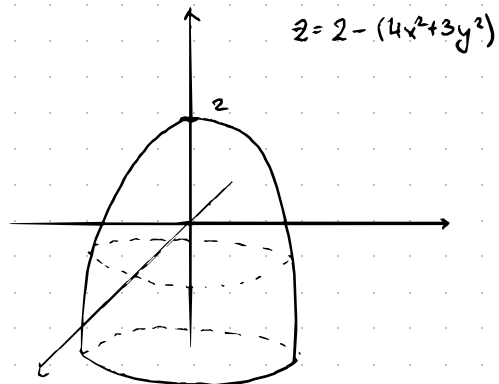
$$z = x^2 + y^2$$

kružni
paraboloid

Analogno oko drugih osi,
npr. $F(y, z)$ oko osi z

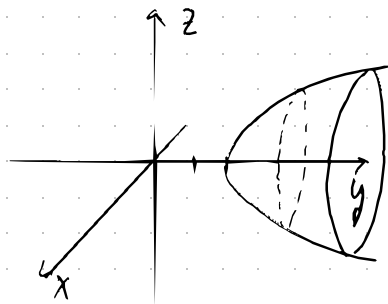
$$\rightarrow F(\pm\sqrt{x^2+y^2}, z) = 0$$

b) $z = 2 - 4x^2 - 3y^2$ ^{elipsa!}



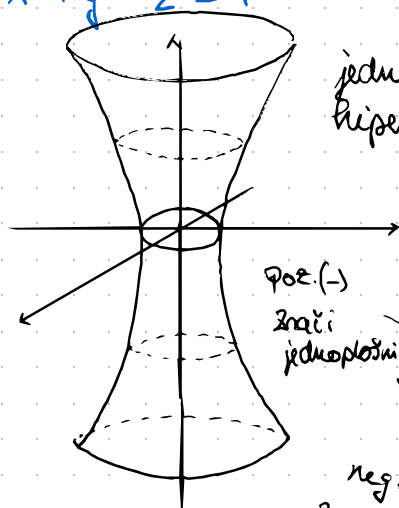
$$z = 2 - (4x^2 + 3y^2)$$

c) $y = 2 + x^2 + z^2$



Príklady:

a) $x^2 + y^2 - z^2 = 1$



jednoplášňový
hyperboloid

poz. (-)

značí
jednoplášňový

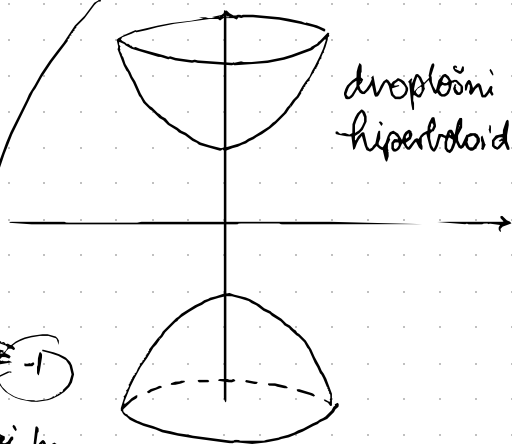
$x^2 + y^2 - z^2 = -1$

neg. (-)
značí
dvojplošňový

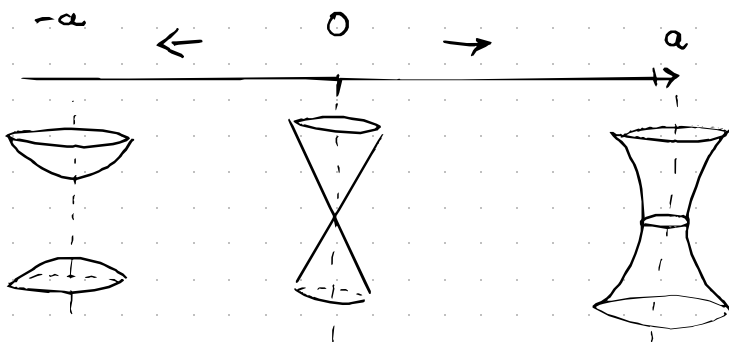
Ovzaj br.
značí šírku

b) $-x^2 - y^2 + z^2 = 1$ prázdné

hyperbola



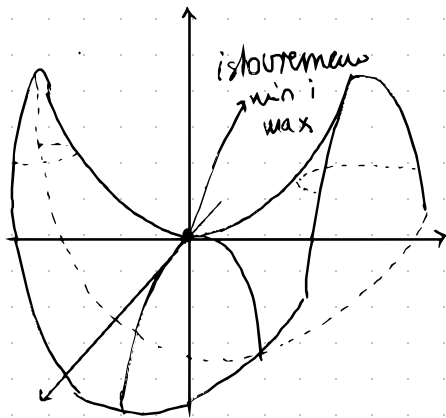
dvojplošňový
hyperboloid



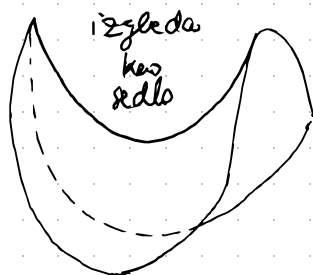
SEDLASTE PLOHE

jako slicno kao paraboloid ($z = x^2 + y^2$)

→ ovde je $z = x^2 - y^2$



hiperbolni paraboloid



ili čips, ali ovde u sedlo u can't unsee it

J(R-2020)

1) a) $f(x, y, z) = 5 - \sqrt{x^2 + 4y^2 + 9z^2}$

Def da je ≥ 0 ali onaj je $\geq 0 \Rightarrow \mathbb{R}^3$

$\text{Im} f = [-\infty, 5]$

traka nivo plohe

$$5 - \sqrt{x^2 + 4y^2 + 9z^2} = c$$

$$\sqrt{x^2 + 4y^2 + 9z^2} = 5 - c$$

$$x^2 + 4y^2 + 9z^2 = (5 - c)^2 \Rightarrow \text{elipsoid}$$

b) $T(\sqrt{3}, 1, 1) \rightarrow f(\sqrt{3}, 1, 1) = 5 - \sqrt{3 + 4 + 9} = 5 - 4 = 1$
x y z

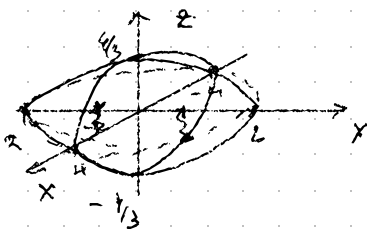
nivo je $c = 1 \Rightarrow x^2 + 4y^2 + 9z^2 = (5 - c)^2$

$x^2 + 4y^2 + 9z^2 = 16$ nivo ploha

$$\frac{x^2}{16} + \frac{4y^2}{16} + \frac{9z^2}{16} = 1$$

$a = 4 \quad b = 2 \quad c = \frac{4}{3}$

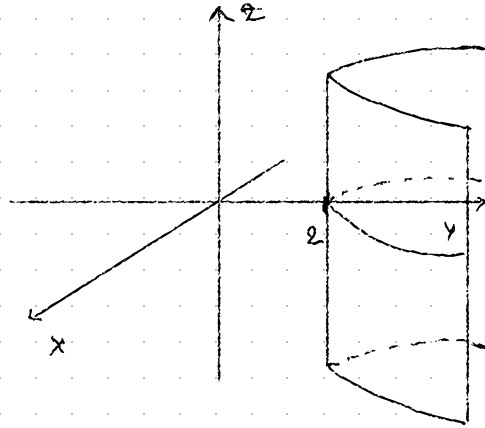
\Rightarrow



P.e.) $y = 1 + \sqrt{1+x^2}$ → hipérbola posada p o y $z=1$

$$(y-1)^2 = 1+x^2$$

$$\underline{x^2 - (y-1)^2 = -1}$$



hiperbólico
cilindro