

Mavzu:

Ikkinchi tartibli sirtlar. Sfera.
Ellipsoid, bir va ikki pallali
giperboloidlar

Reja:

1. Ikkinchi tartibli sirtlar.
2. Sfera. Ellipsoid
3. Bir va ikki pallali giperboloidlar.

Uch o'lchovli $Oxyz$ Dekart sistemasida har qanday sirt biror $F(x, y, z) = 0$ tenglama bilan yoziladi, bu yerda (x, y, z) – sirt ixtiyoriy nuqtasining koordinatasi. Agar $F(x, y, z)$ - x, y, z o'zgaruvchilarga nisbatan ikkinchi darajali ko'phad bo'lsa, u holda $F(x, y, z) = 0$ tenglama ikkinchi tartibli tenglama deyiladi, shu tenglama yordamida tasvirlanadigan sirt esa *ikkinchi tartibli sirt* deyiladi.

Agar sirtning koordinatalar sistemasiga nisbatan joylashishi alohida xususiyatga ega bo'lsa (masalan, ba'zi koordinatalar tekisliklariga nisbatan simmetrik joylashgan bo'lsa), u holda uning tenglamasi juda sodda ko'rinishga ega bo'ladi va u *kanonik tenglama* deyiladi.

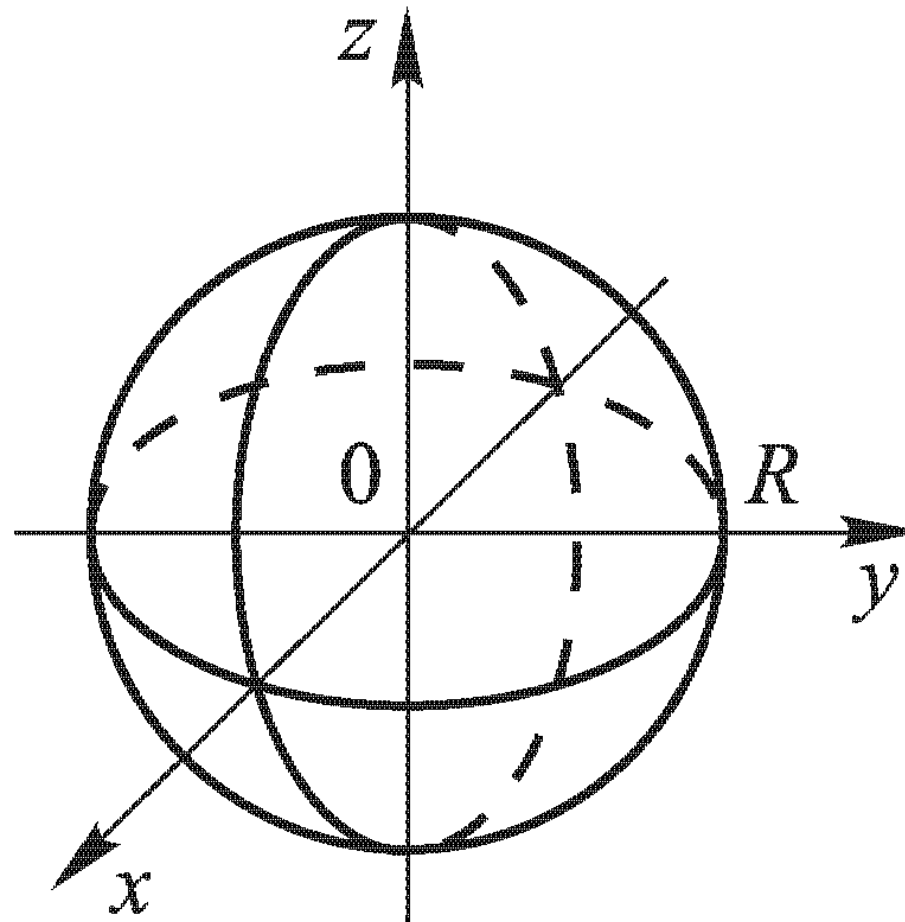
Ikkinchi tartibli sirtning umumiy tenglamasi

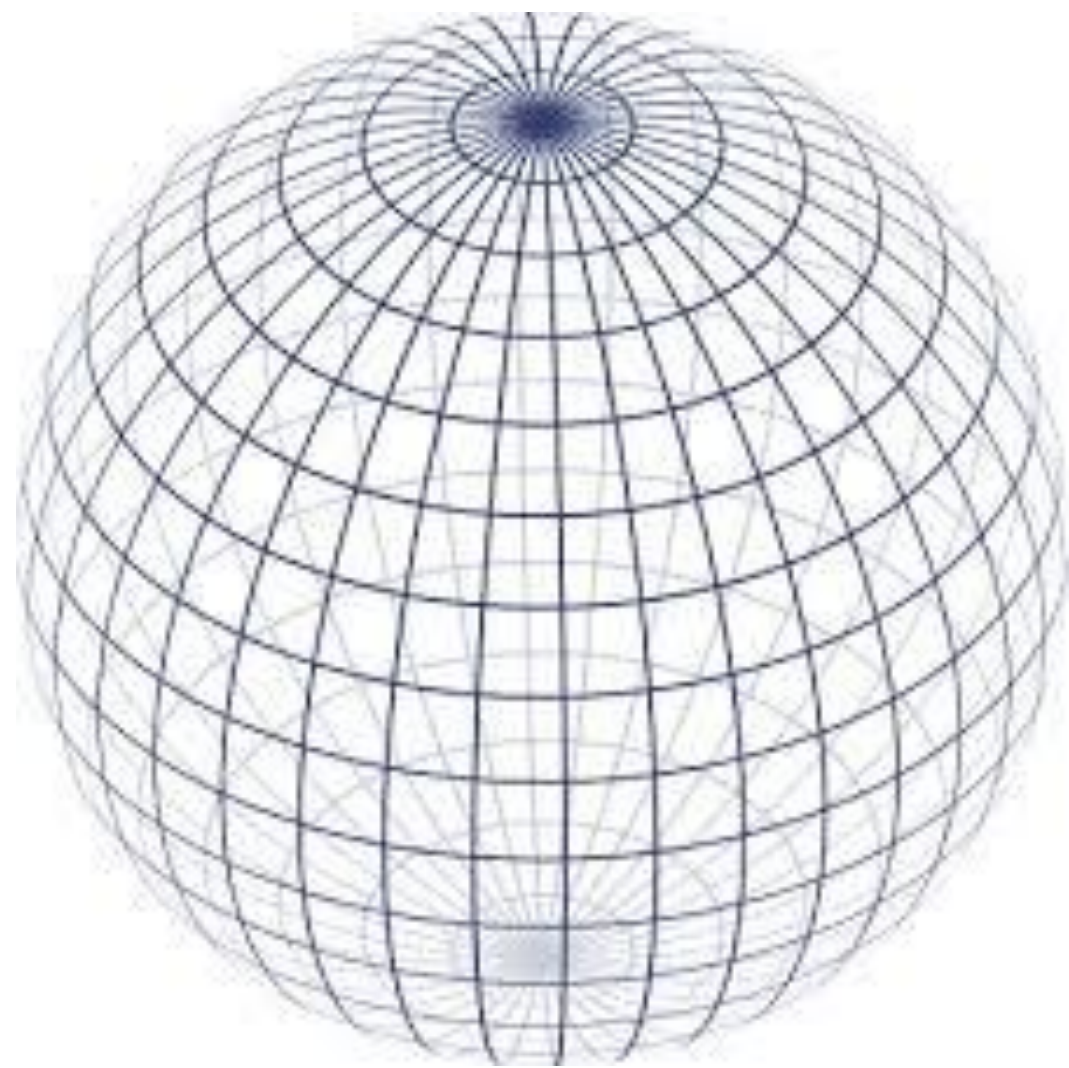
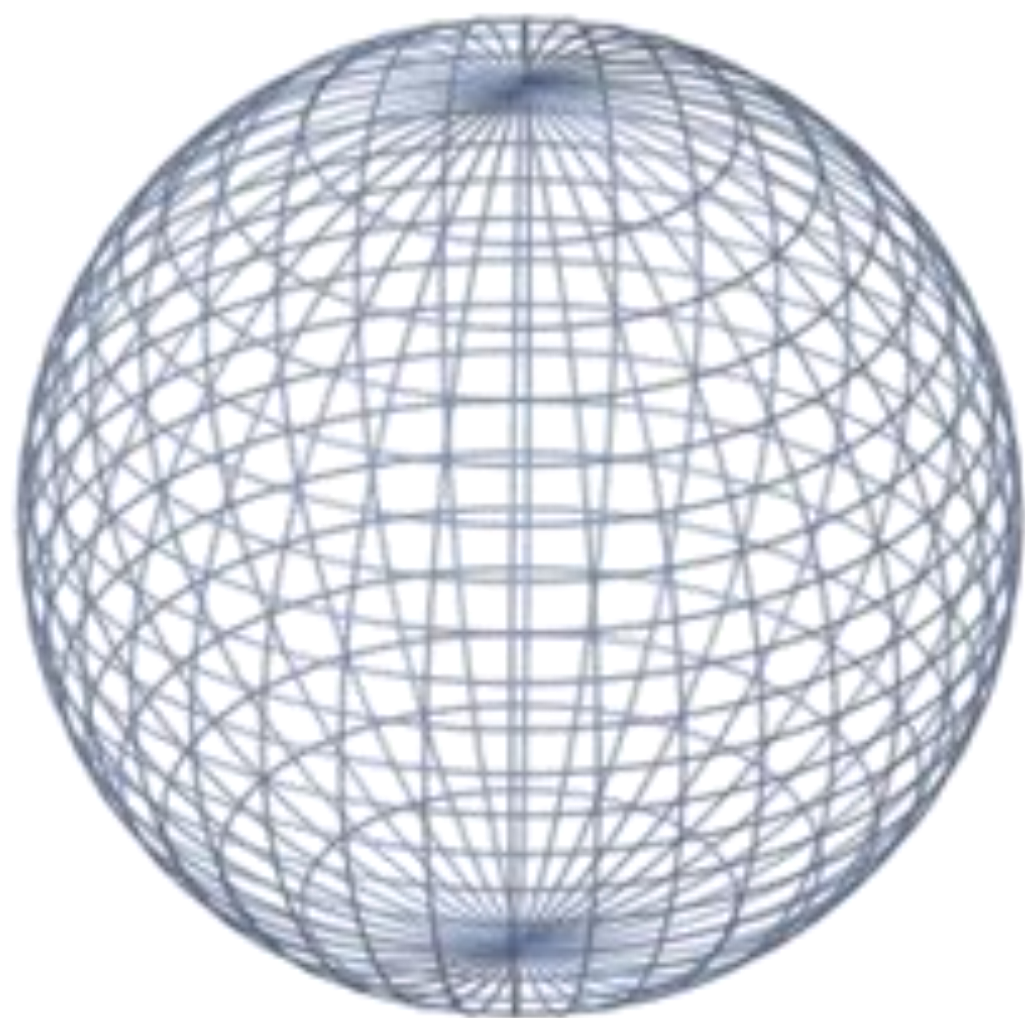
$$\begin{aligned} & a_{11}x^2 + a_{22}y^2 + a_{33}z^2 + \\ & + 2a_{12}xy + 2a_{13}xz + 2a_{23}yz + \\ & + 2a_1x + 2a_2y + 2a_3z + a_0 = 0 \end{aligned}$$

SFERA

Markazi koordinatalar boshida bo'lgan R radiusli sfera tenglamasi

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





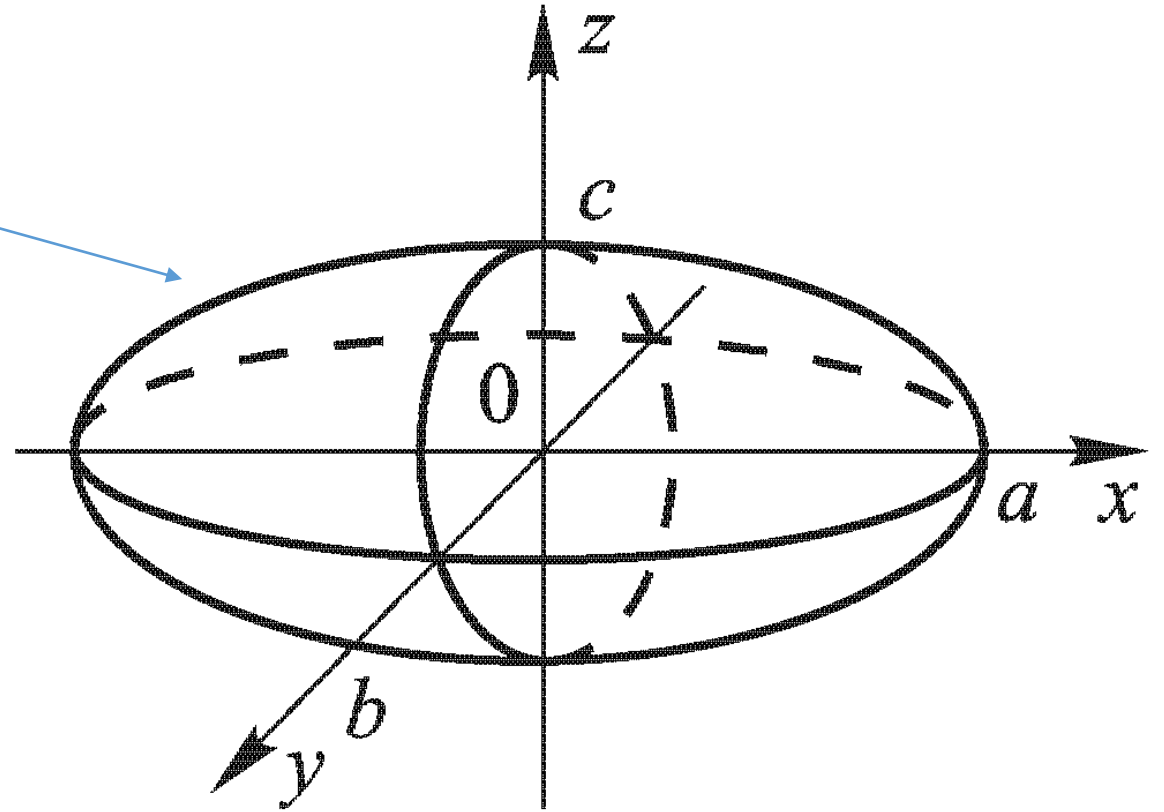
Markazi $M(x_0, y_0, z_0)$ nuqtada bo'lgan
 R radiusli sfera tenglamasi

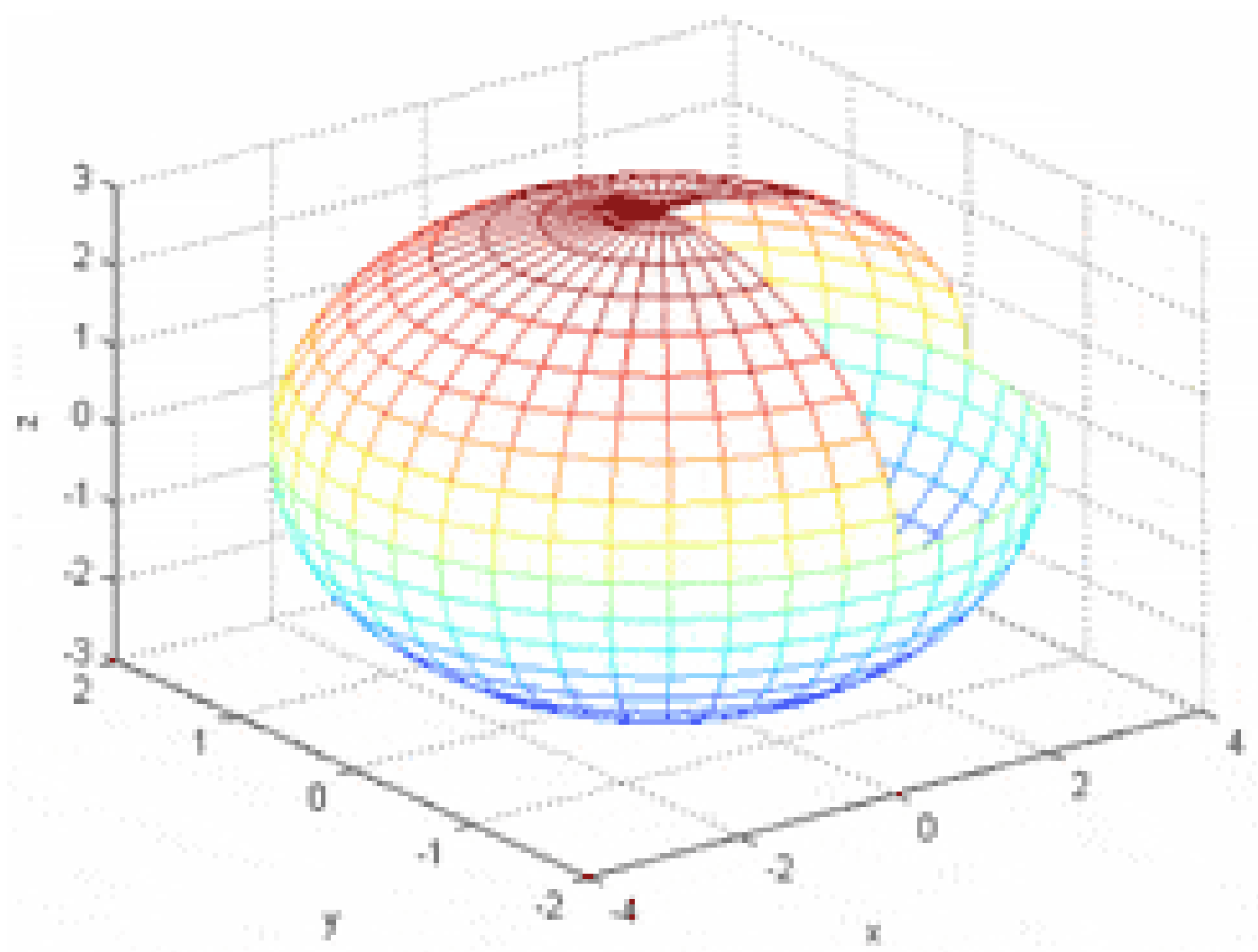
$$(x - x_0)^2 + (y - y_0)^2 + (z - z_0)^2 = R^2$$

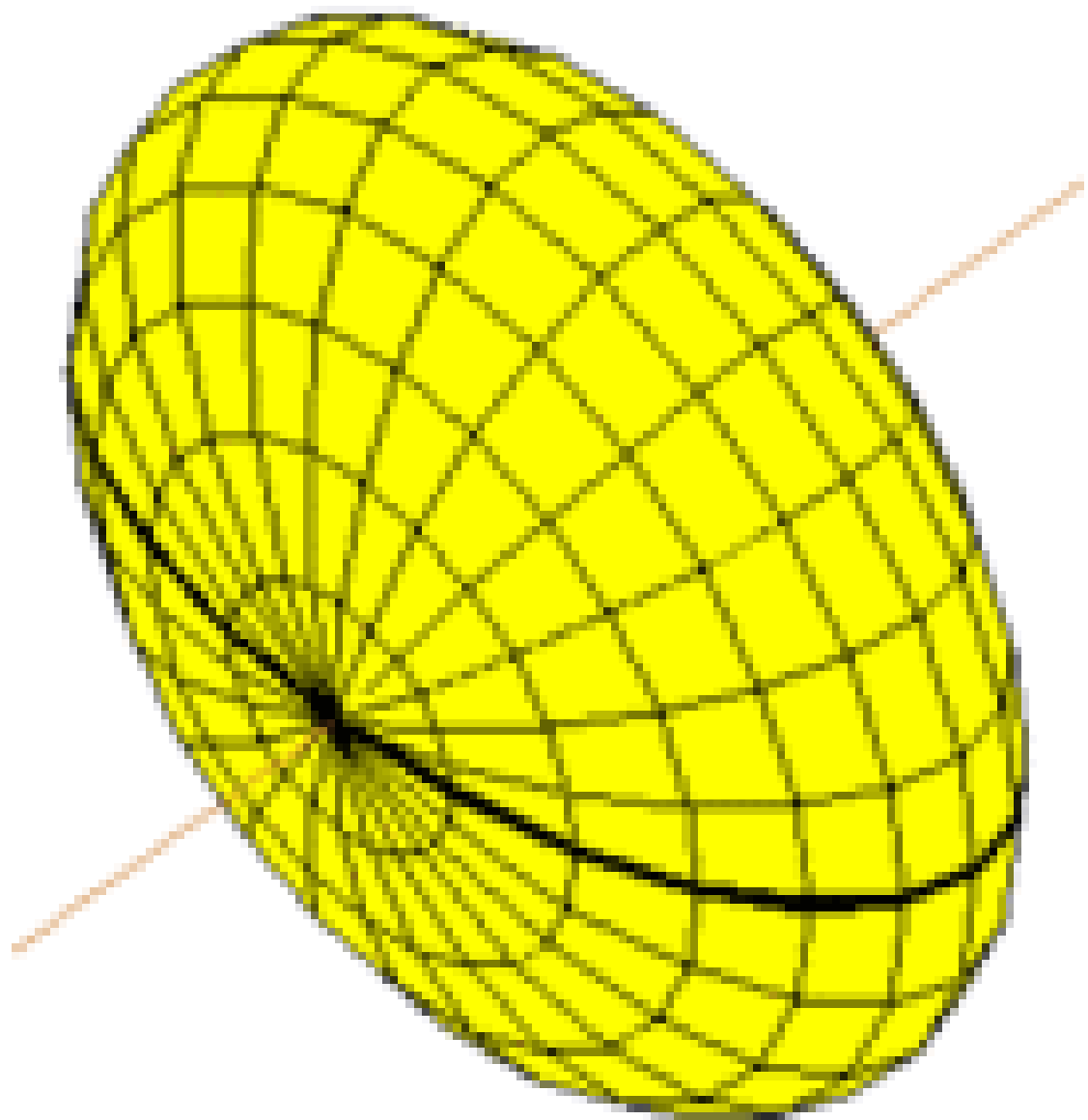
Ellipsoid

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$$

$$\frac{(x-x_0)^2}{a^2} + \frac{(y-y_0)^2}{b^2} + \frac{(z-z_0)^2}{c^2} = 1$$







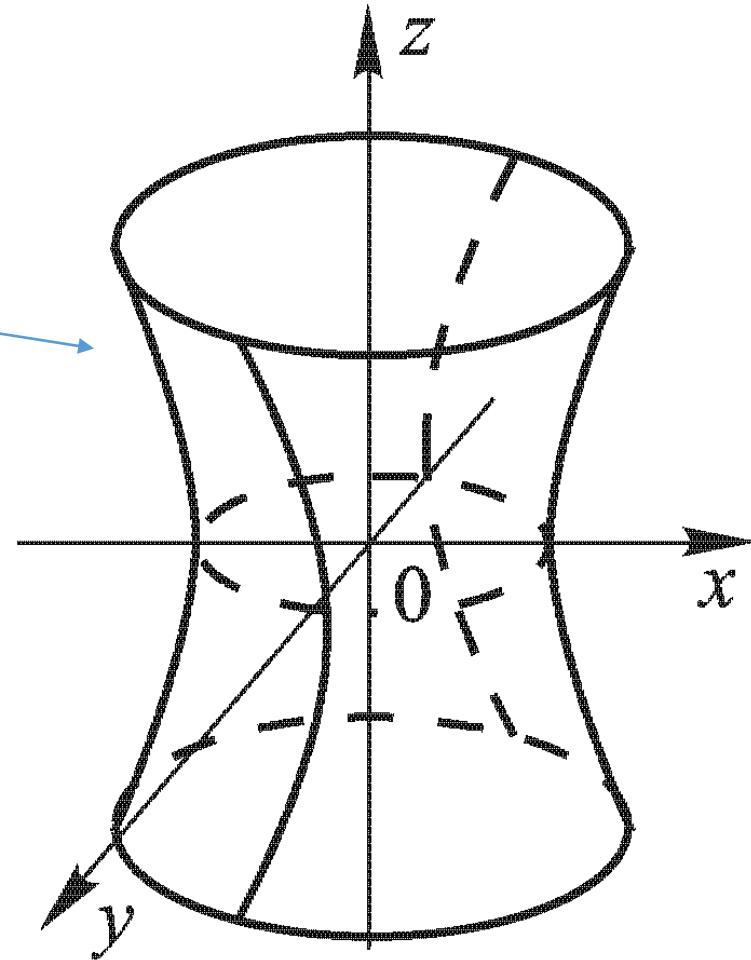
Sfera ellipsoiddir,
chunki ellipsoid tenglamasida
 $a = b = c = R$ bo'lsa, sfera
tenglamasi hosil bo'ladi.

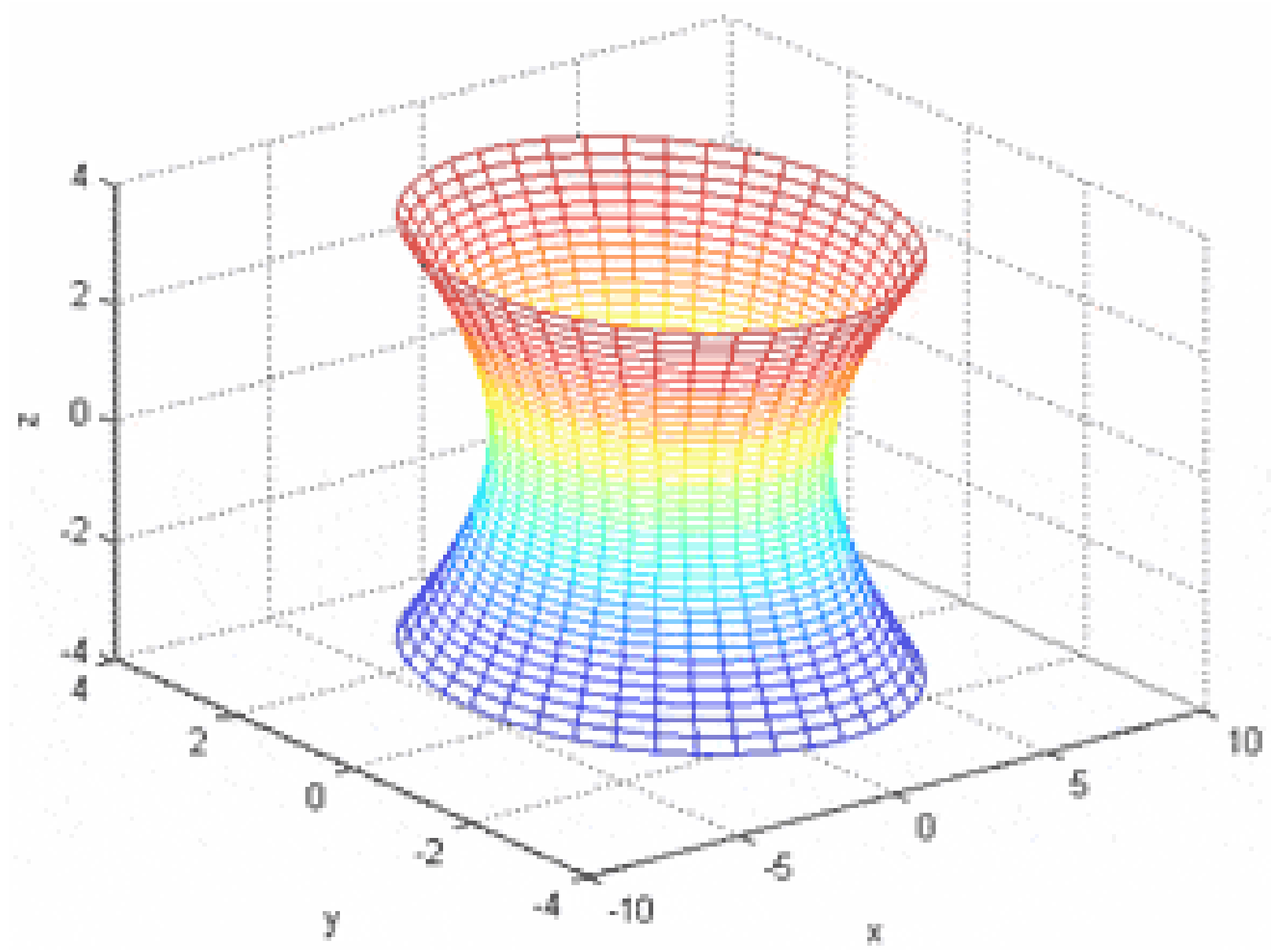
Bir pallali giperboloid

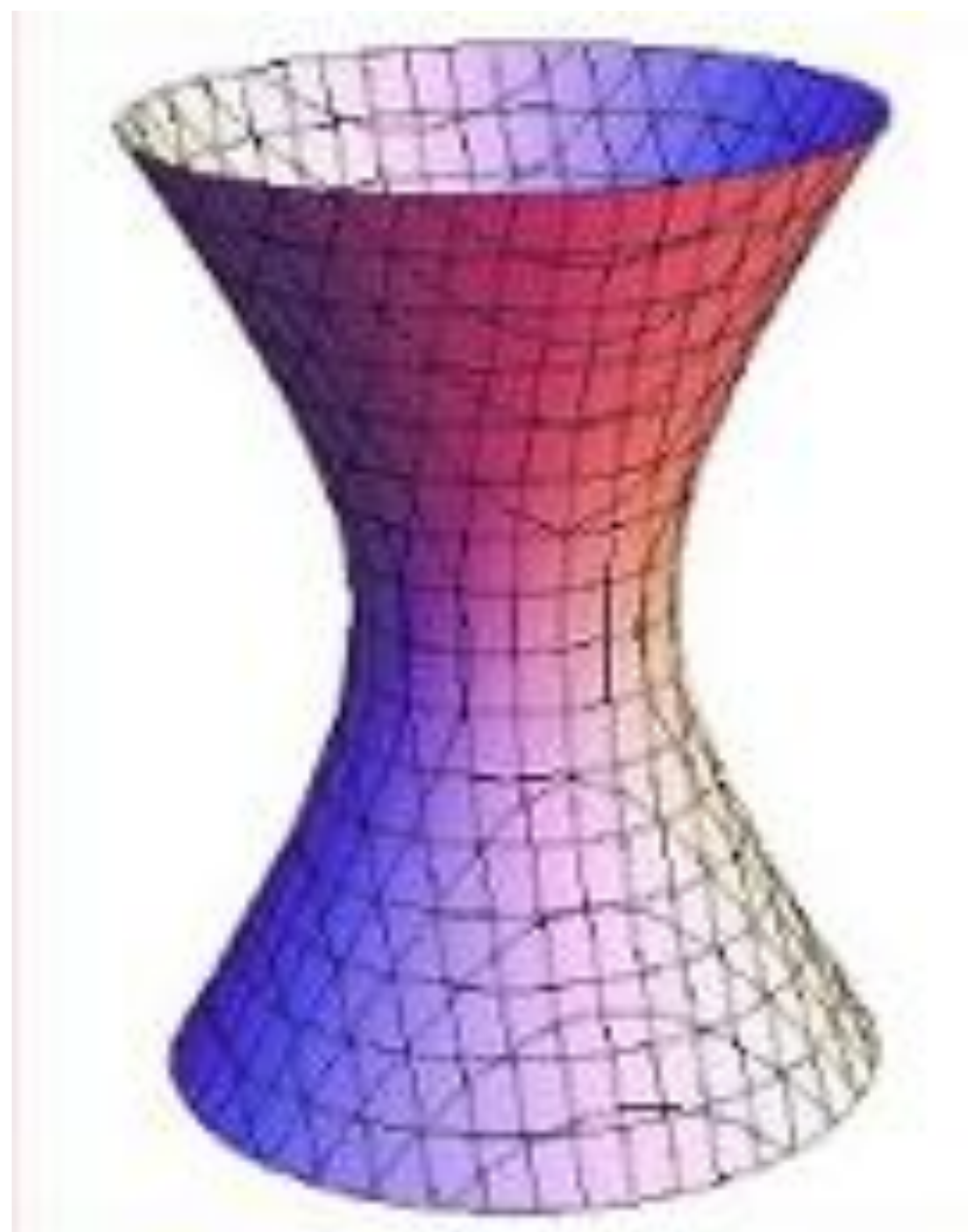
$$\frac{x^2}{a^2} + \frac{y^2}{b^2} - \frac{z^2}{c^2} = 1$$

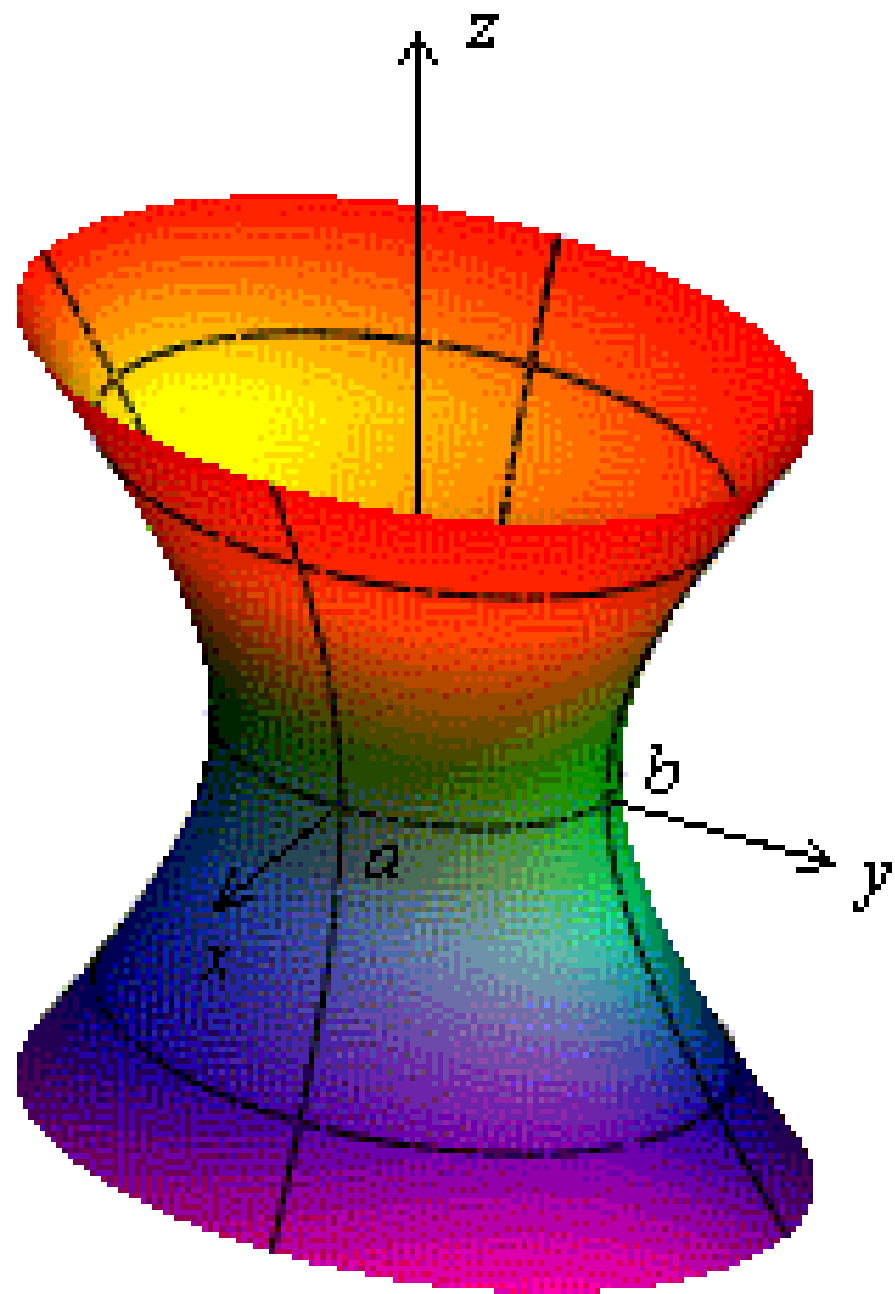
$$\frac{x^2}{a^2} - \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$$

$$-\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$$







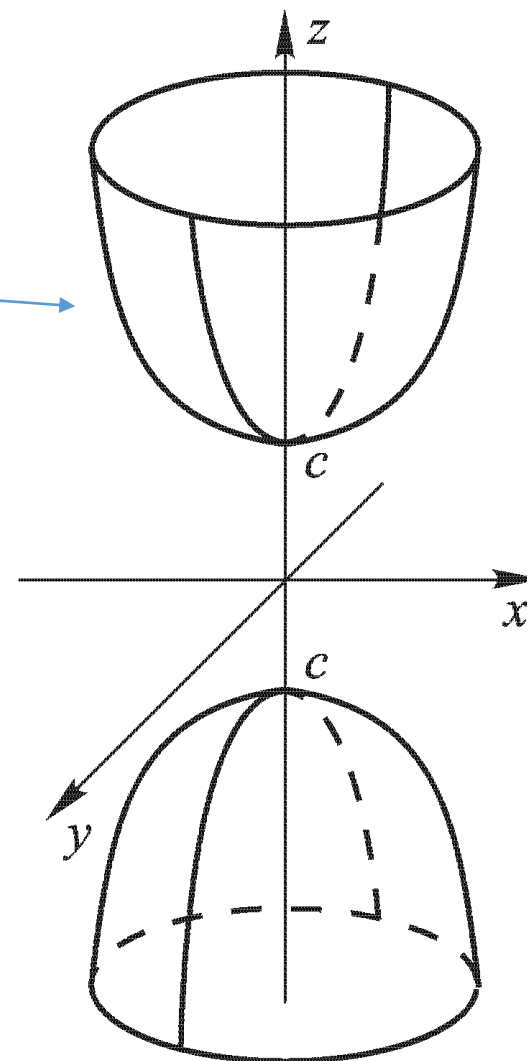


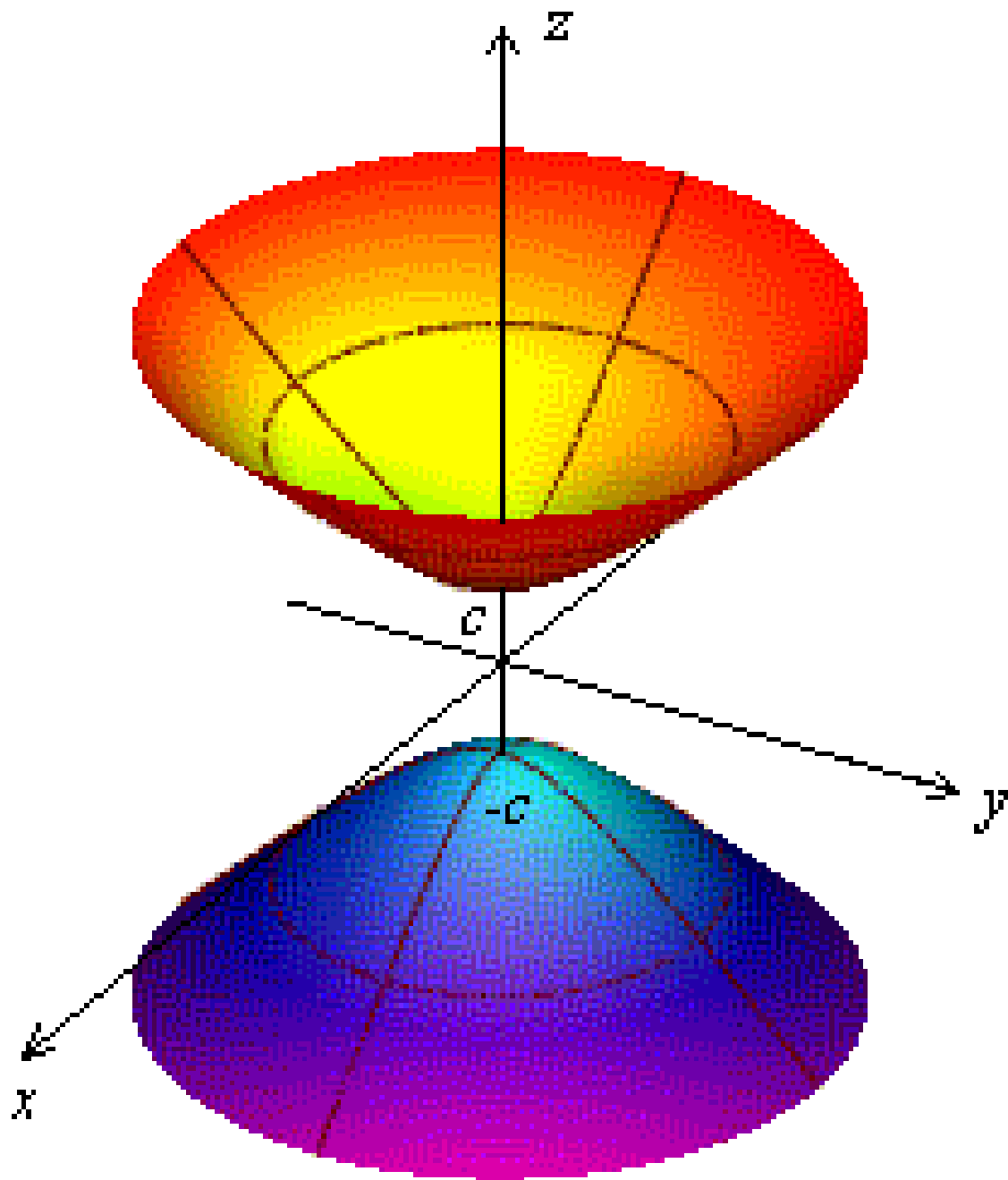
Ikki pallali giperboloid

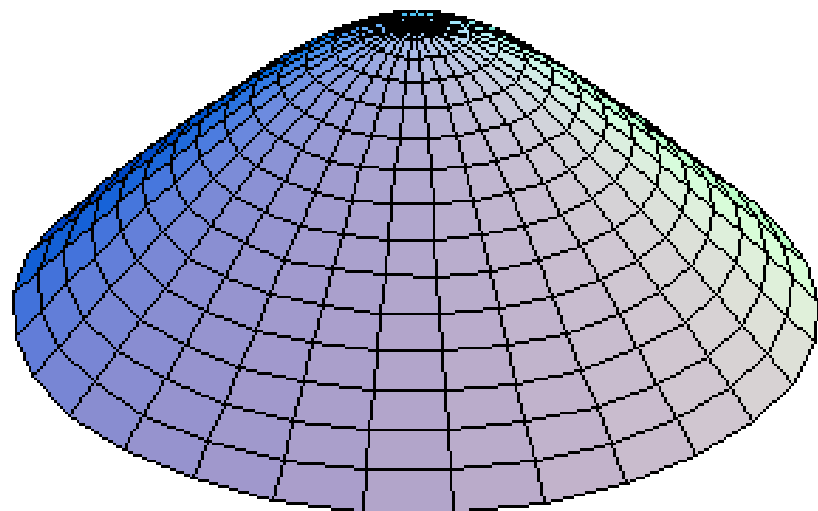
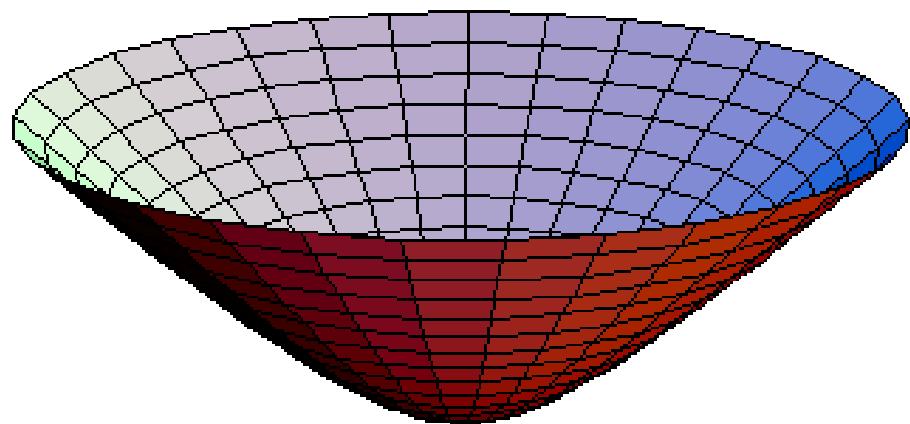
$$\frac{x^2}{a^2} + \frac{y^2}{b^2} - \frac{z^2}{c^2} = -1$$

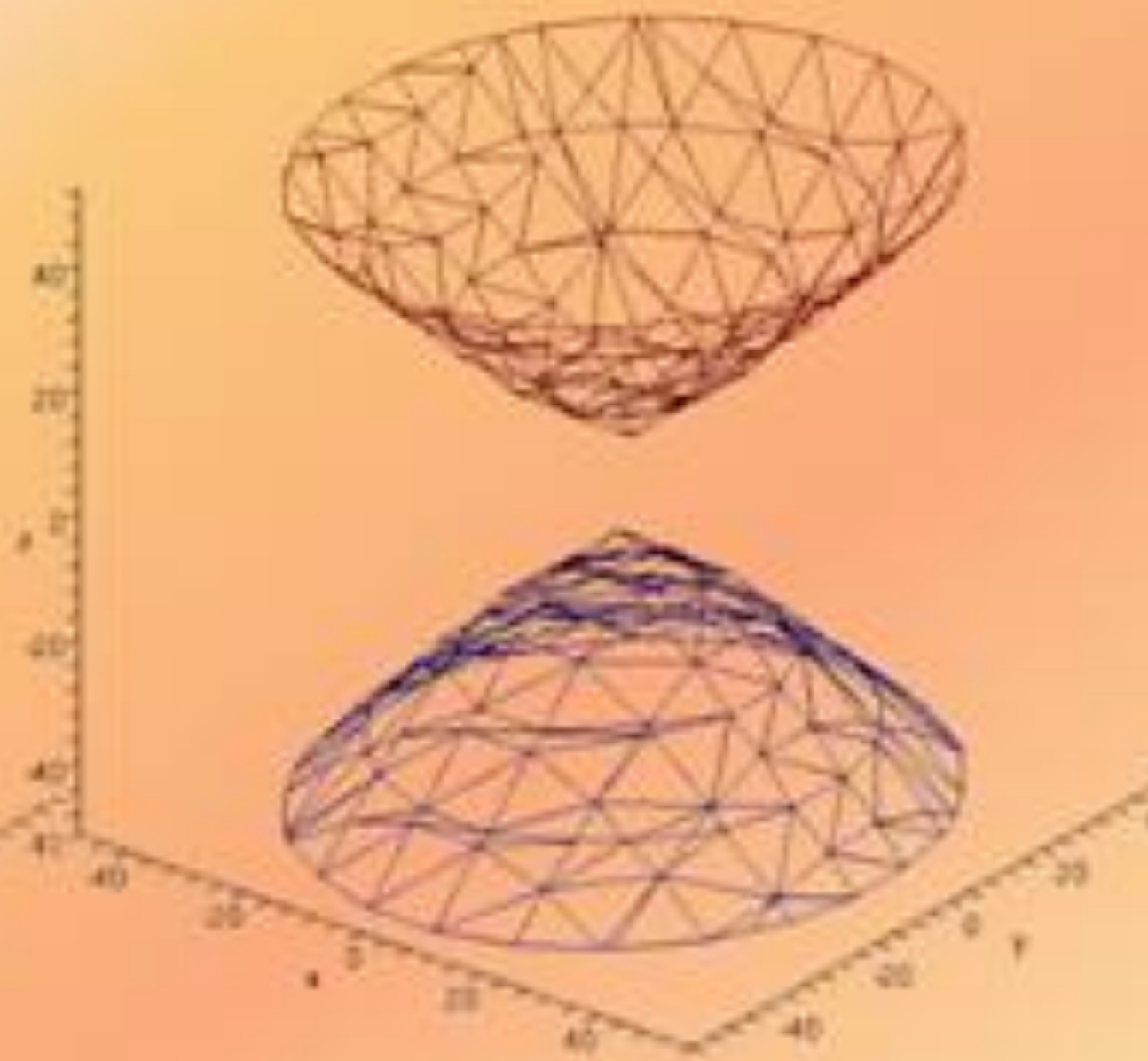
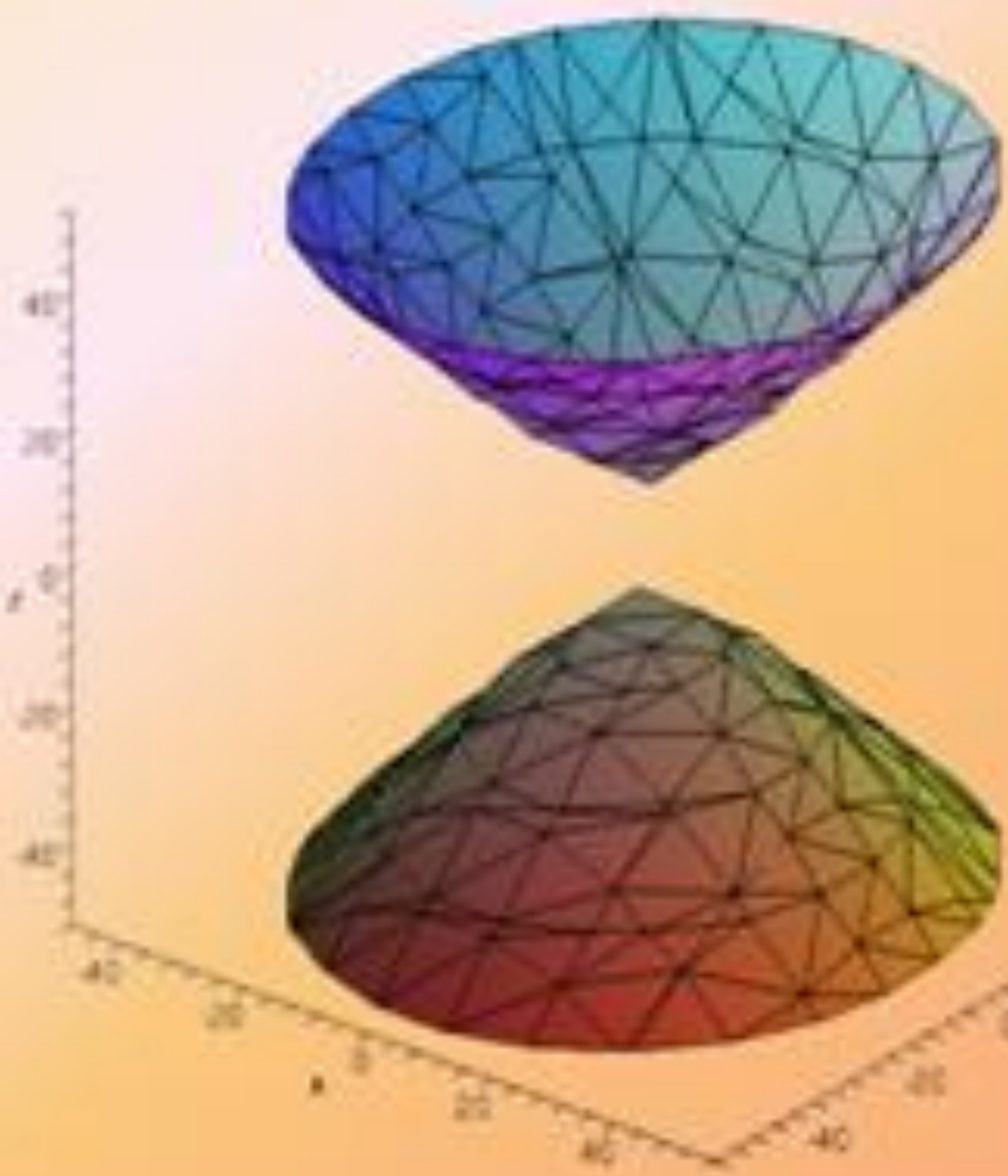
$$\frac{x^2}{a^2} - \frac{y^2}{b^2} + \frac{z^2}{c^2} = -1$$

$$-\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = -1$$



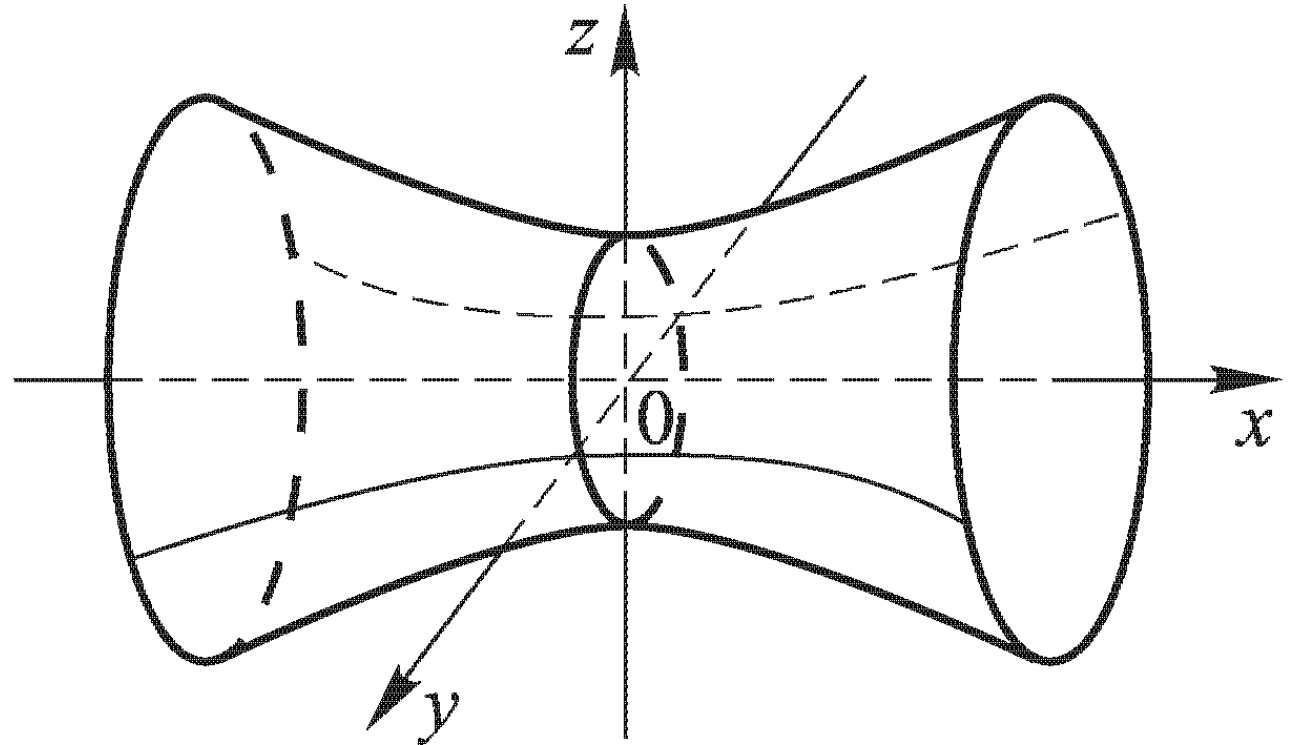






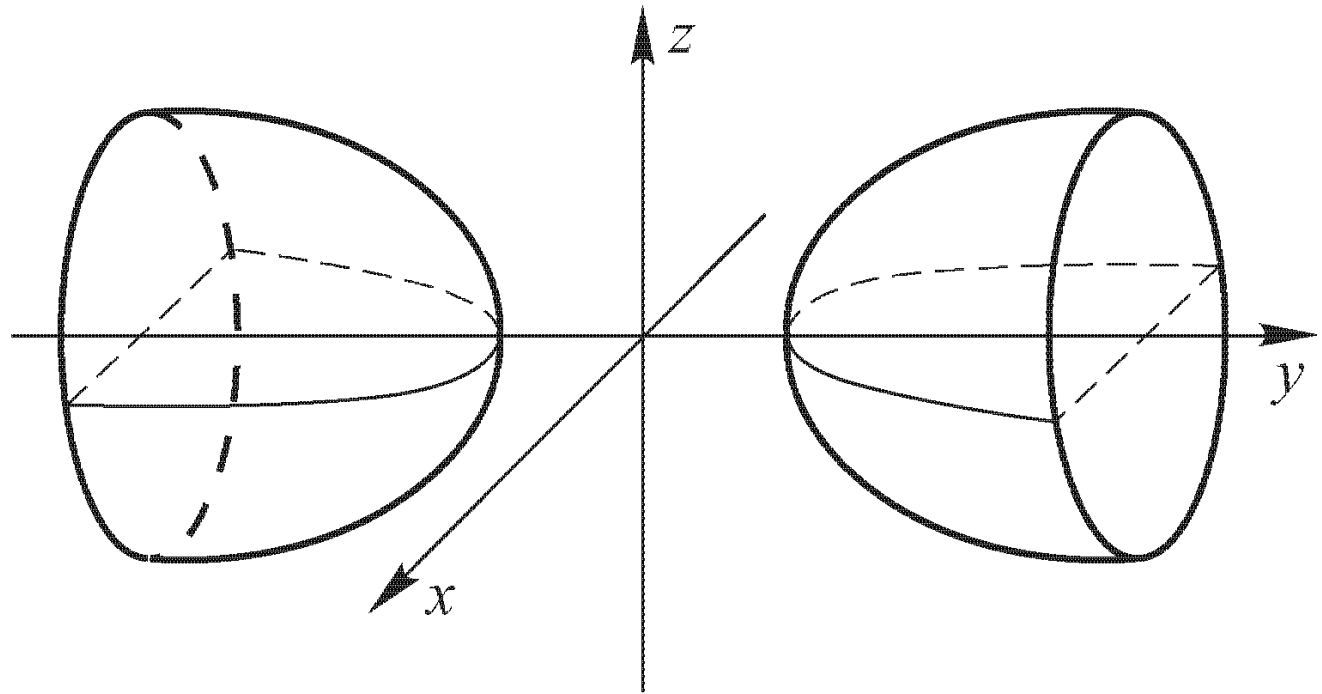
Misollar

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



Misollar

$$2x^2 - y^2 + z^2 + 2 = 0$$



Misollar

$$2y^2 + 2z^2 = 6x$$

