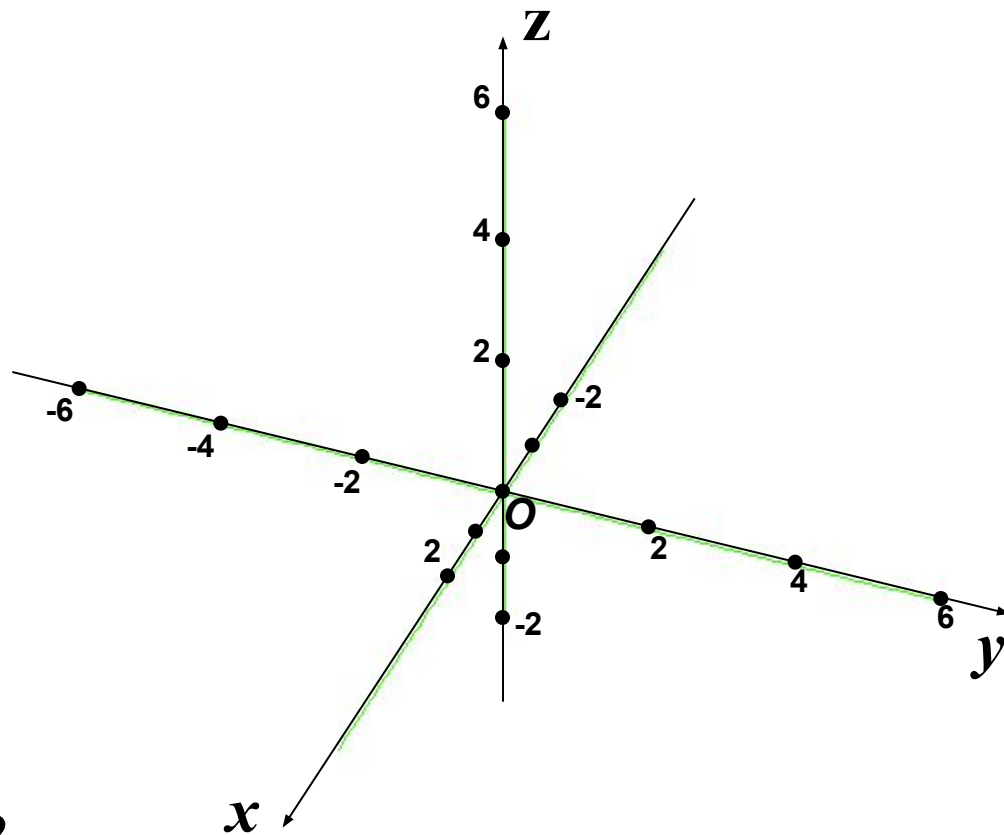
A 3D plot of a hyperbolic paraboloid, also known as a saddle surface. The surface is rendered with a purple-to-blue gradient and a black grid pattern. It curves upwards in one direction and downwards in the other, creating a saddle-like shape. The surface is centered around the origin of a 3D coordinate system.

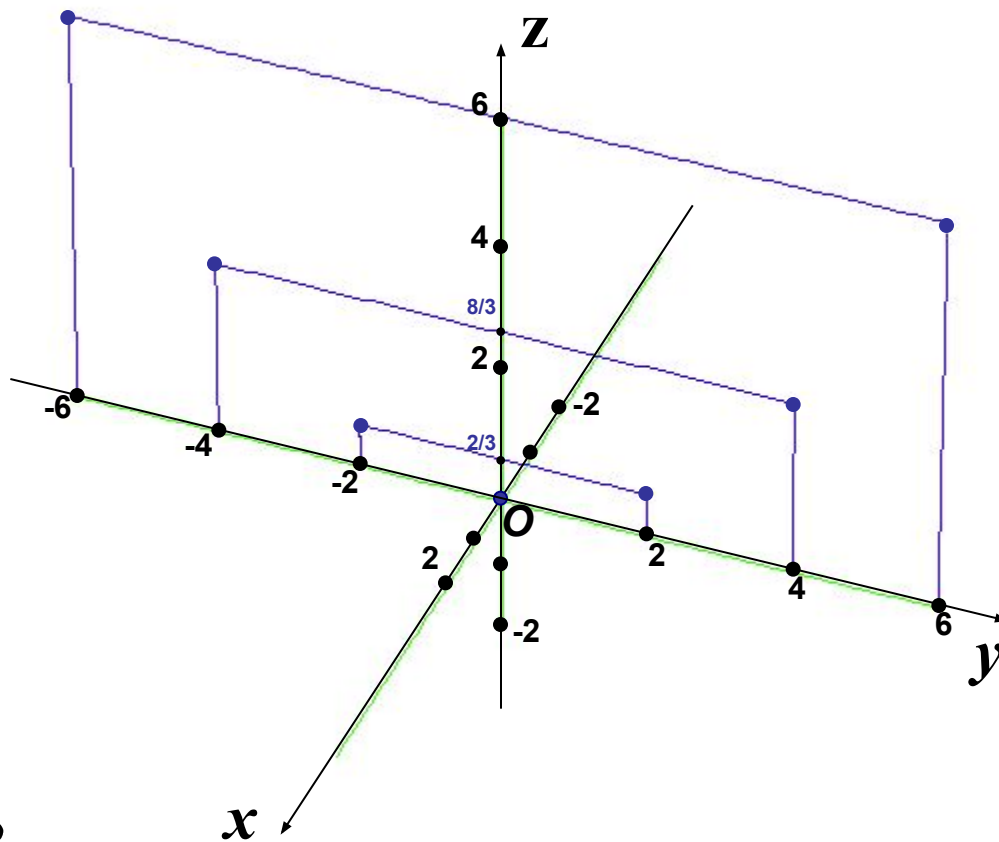
Гиперболический параболоид

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



$$-\frac{x^2}{4} + \frac{y^2}{6} = z$$

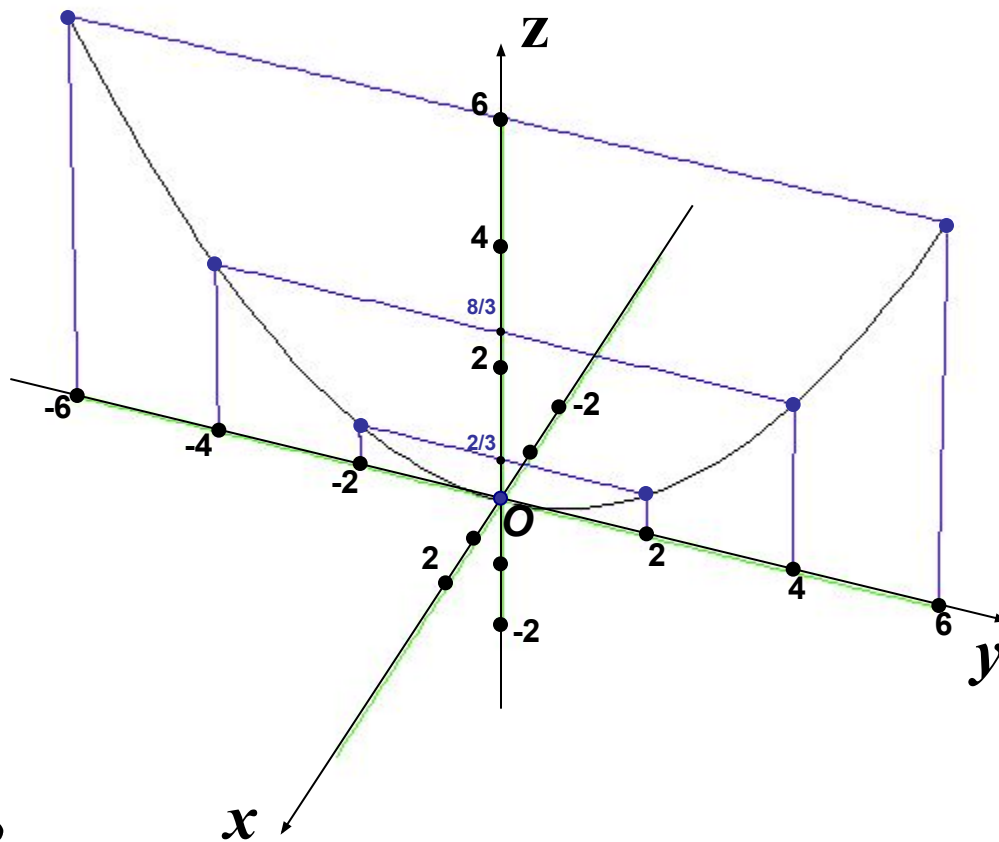
Сечение плоскостью YOZ :



$$\begin{cases} x = 0 \\ \frac{y^2}{6} = z \end{cases}$$

$$-\frac{x^2}{4} + \frac{y^2}{6} = z$$

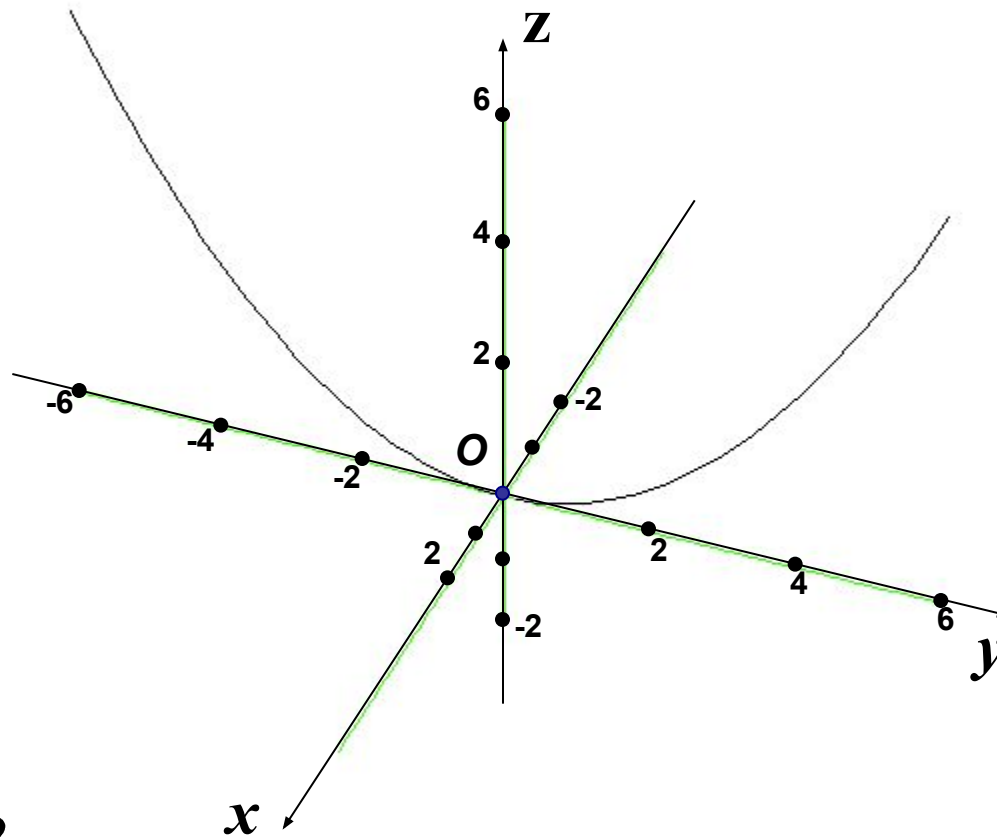
Сечение плоскостью YOZ :



$$\begin{cases} x = 0 \\ \frac{y^2}{6} = z \end{cases}$$

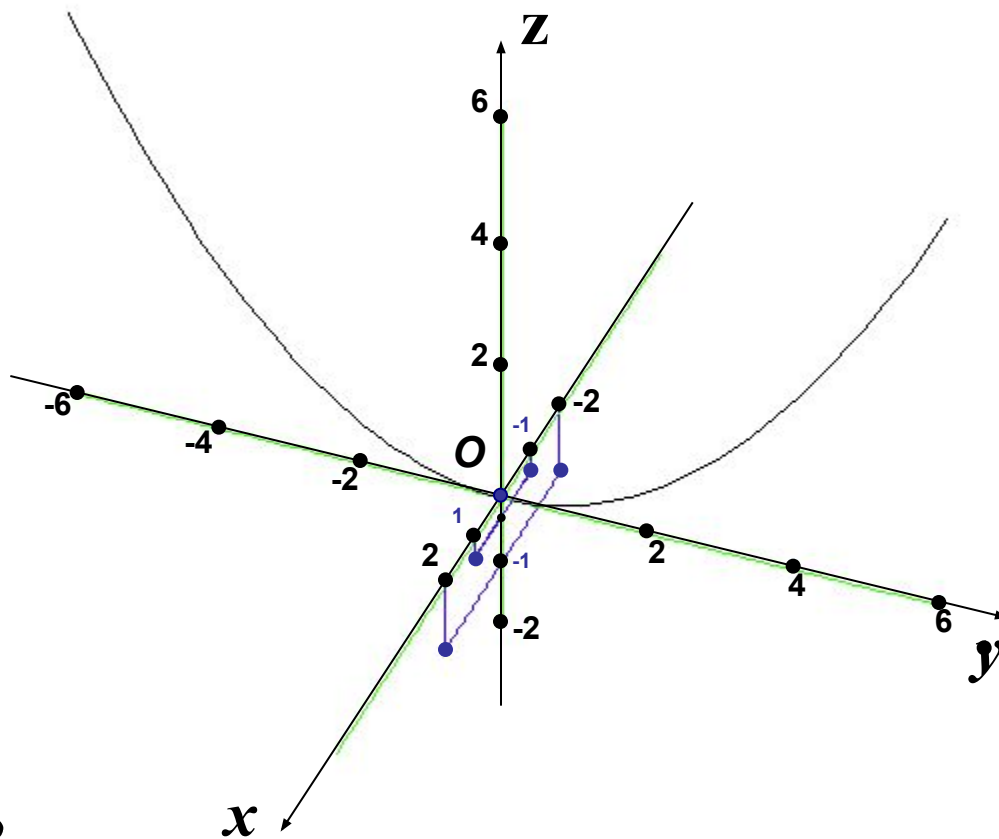
$$-\frac{x^2}{4} + \frac{y^2}{6} = z$$

Первое сечение :



$$-\frac{x^2}{4} + \frac{y^2}{6} = z$$

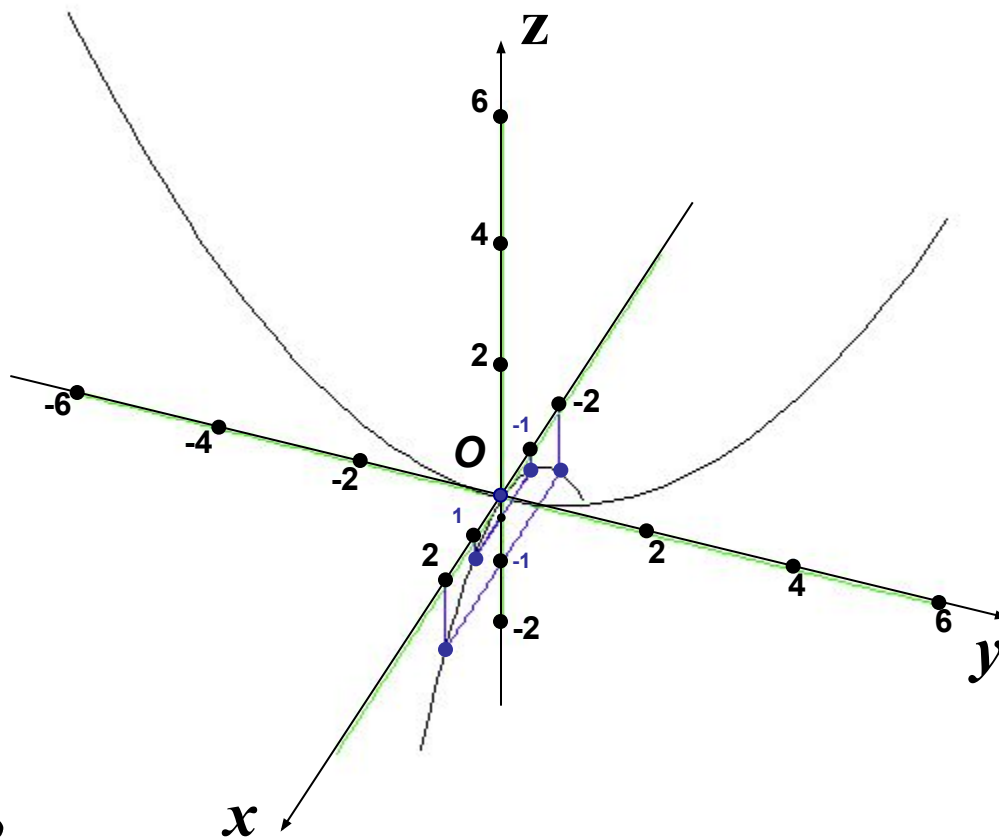
Сечение плоскостью XOZ :



$$\begin{cases} y = 0 \\ -\frac{x^2}{4} = z \end{cases}$$

$$-\frac{x^2}{4} + \frac{y^2}{6} = z$$

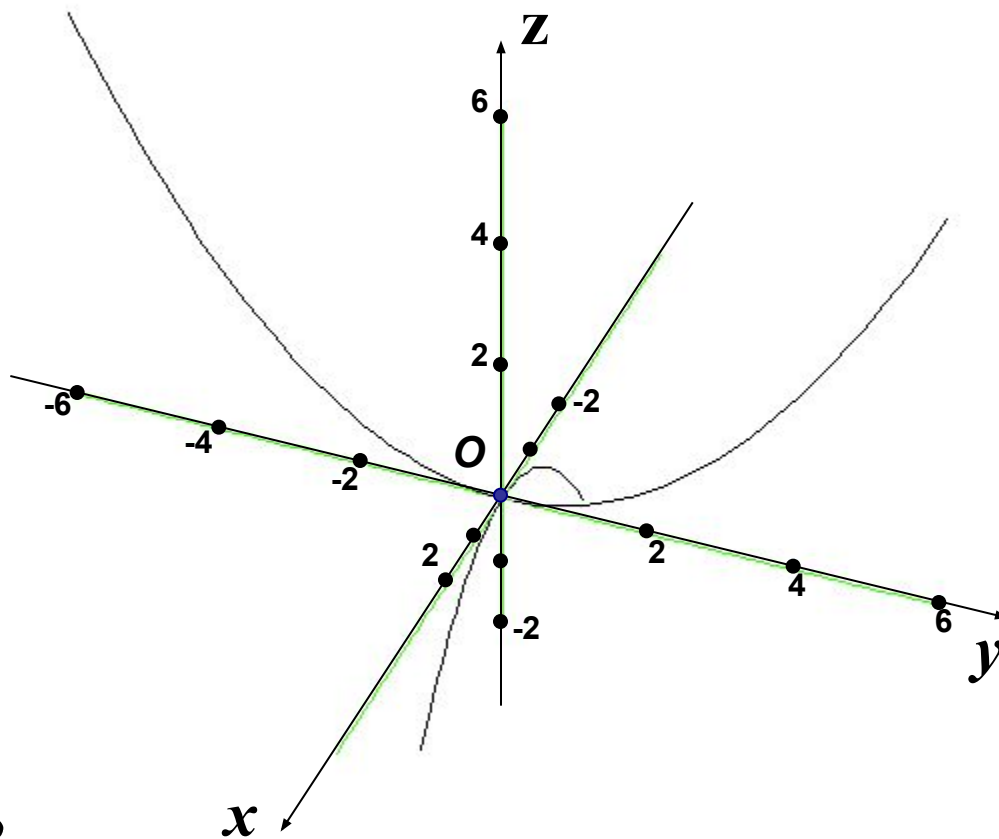
Сечение плоскостью XOZ :



$$\begin{cases} y = 0 \\ -\frac{x^2}{4} = z \end{cases}$$

$$-\frac{x^2}{4} + \frac{y^2}{6} = z$$

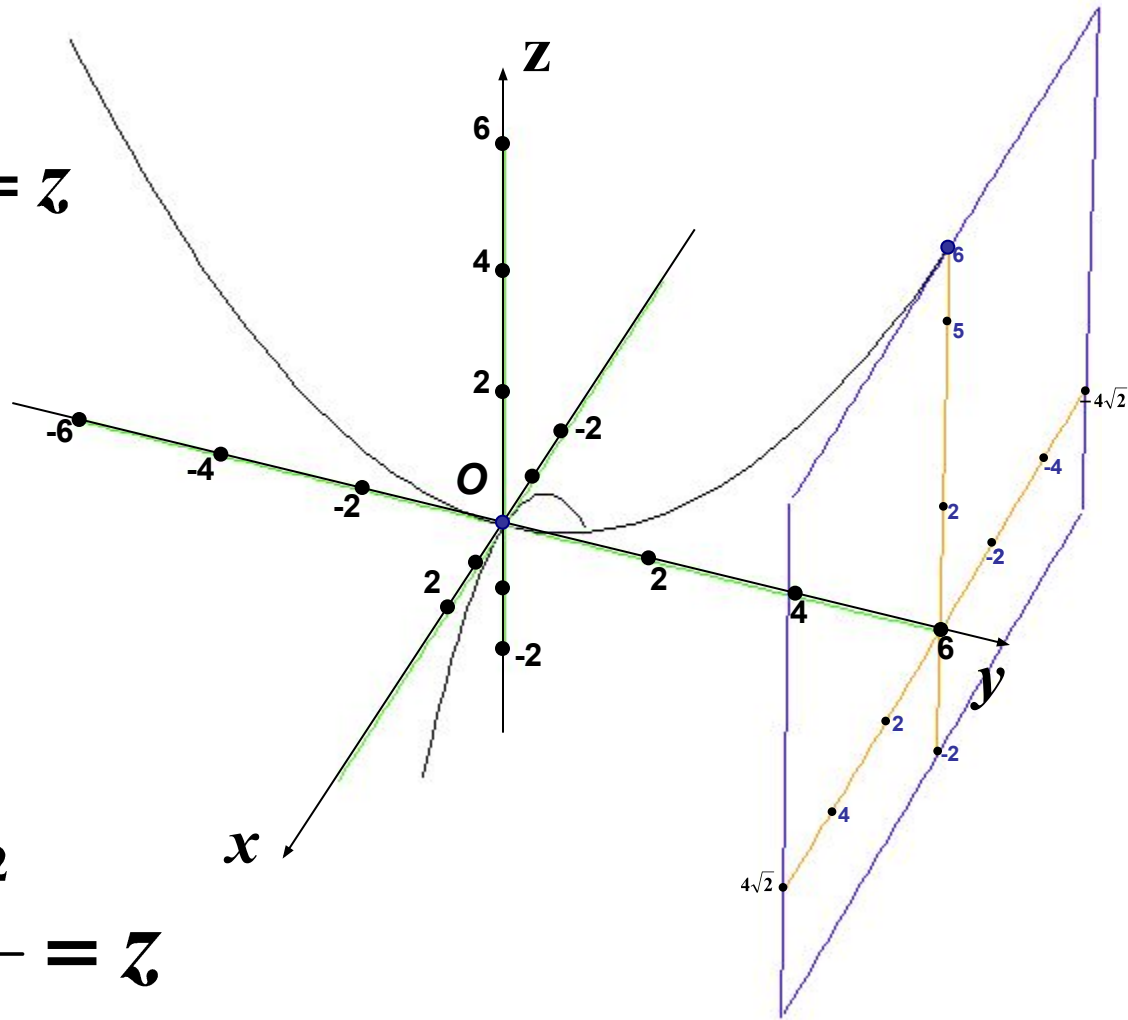
Два сечения :



$$-\frac{x^2}{4} + \frac{y^2}{6} = z$$

Сечение плоскостью $y=6$, параллельной XOZ :

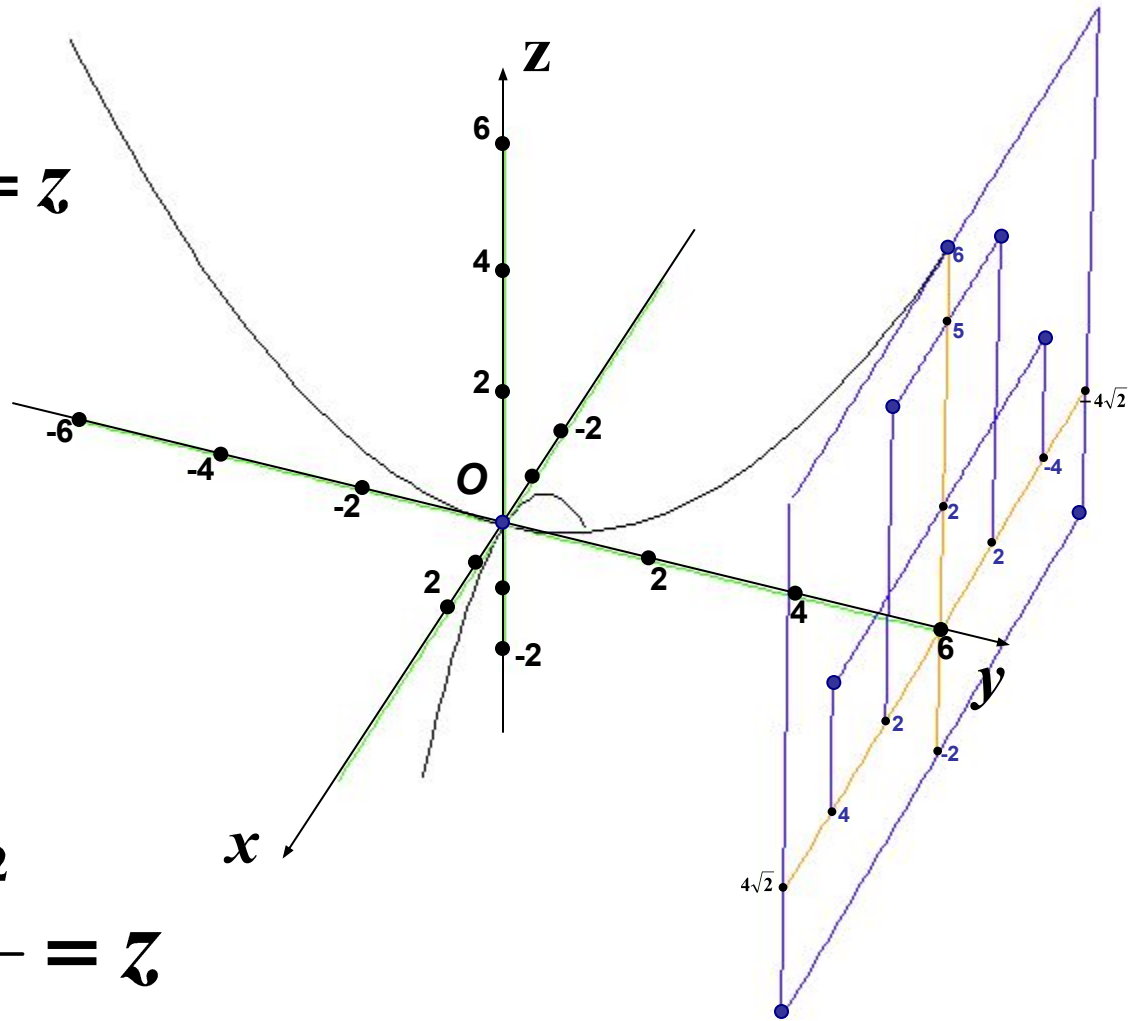
$$\begin{cases} y = 6 \\ -\frac{x^2}{4} + 6 = z \end{cases}$$



$$-\frac{x^2}{4} + \frac{y^2}{6} = z$$

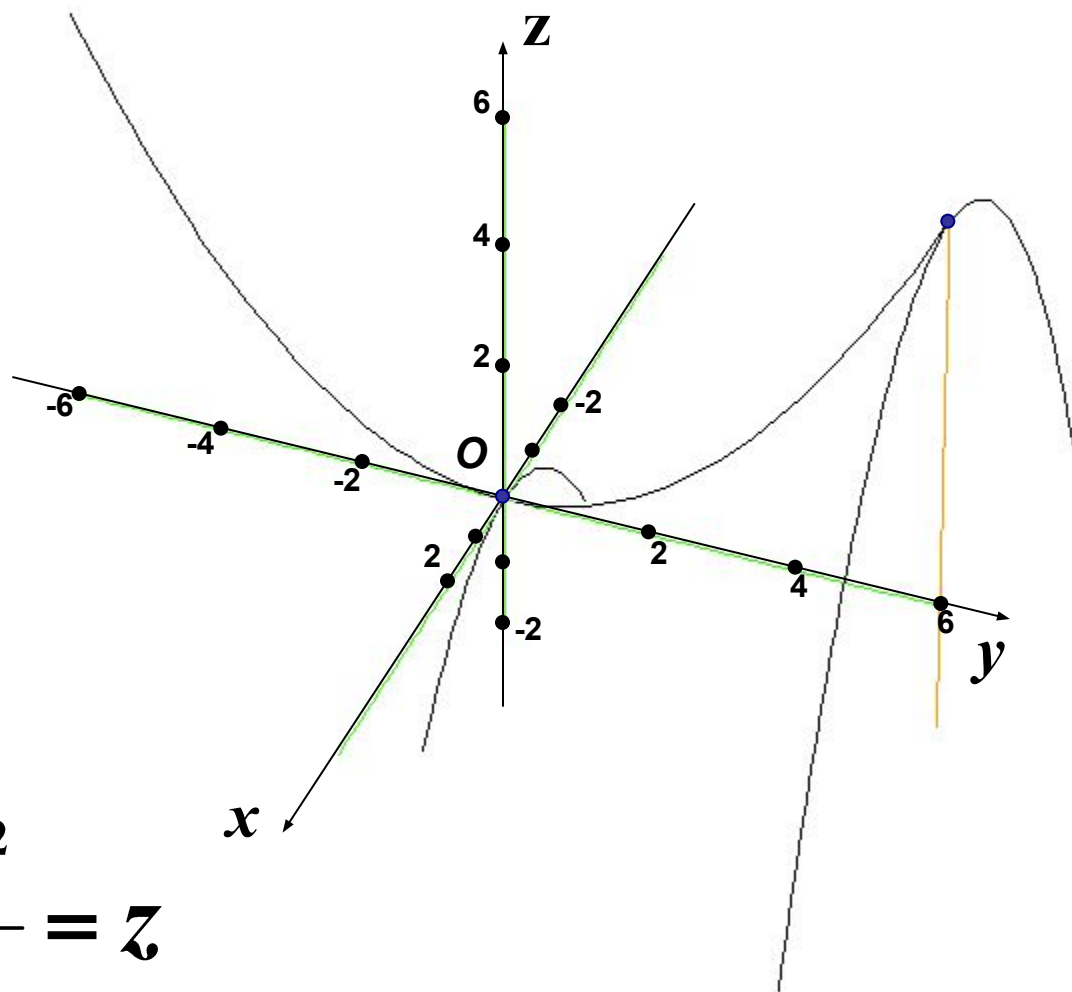
Сечение плоскостью $y=6$, параллельной XOZ :

$$\begin{cases} y = 6 \\ -\frac{x^2}{4} + 6 = z \end{cases}$$



$$-\frac{x^2}{4} + \frac{y^2}{6} = z$$

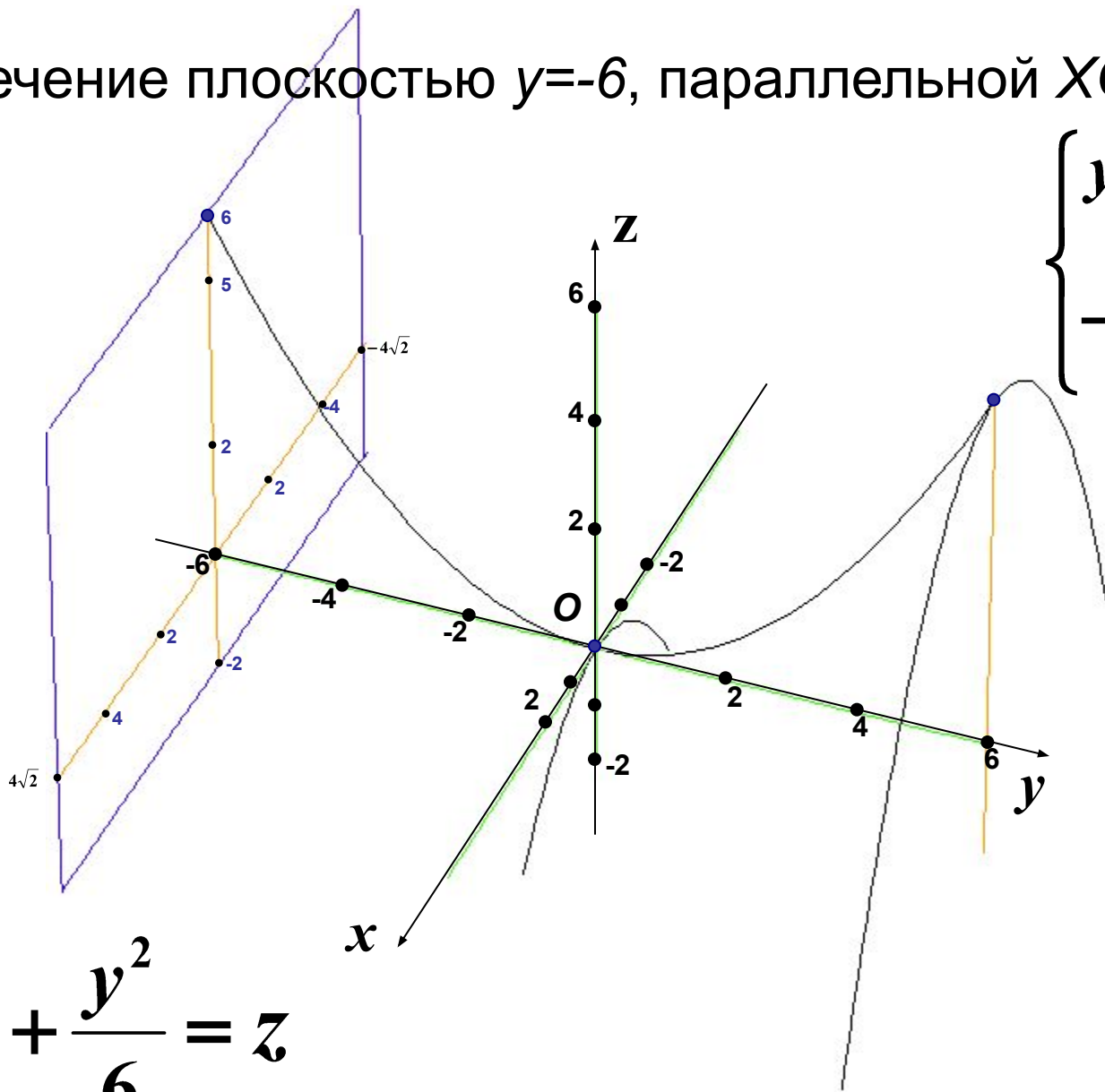
Три сечения :



$$-\frac{x^2}{4} + \frac{y^2}{6} = z$$

Сечение плоскостью $y=-6$, параллельной XOZ :

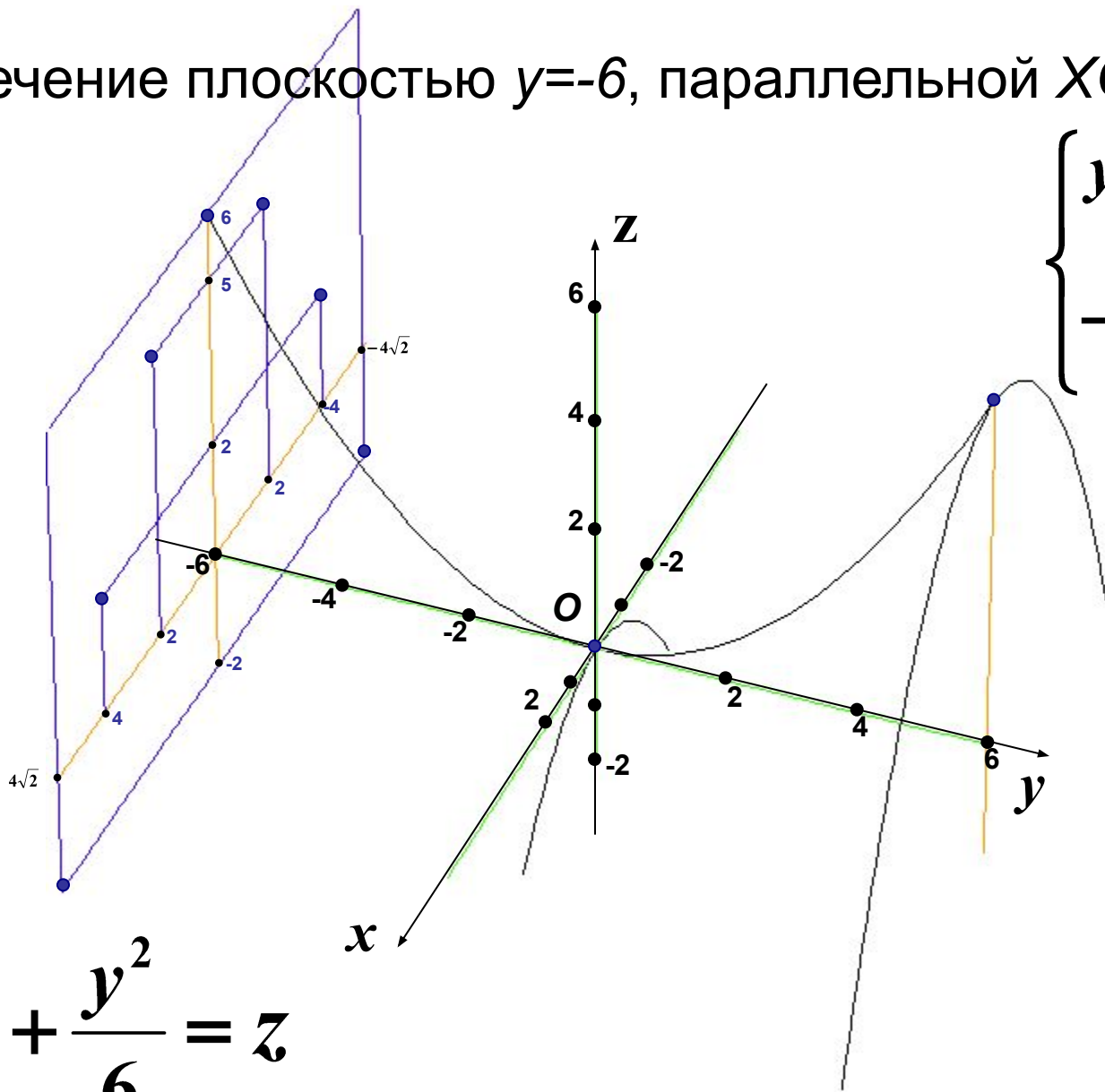
$$\begin{cases} y = -6 \\ -\frac{x^2}{4} + 6 = z \end{cases}$$



$$-\frac{x^2}{4} + \frac{y^2}{6} = z$$

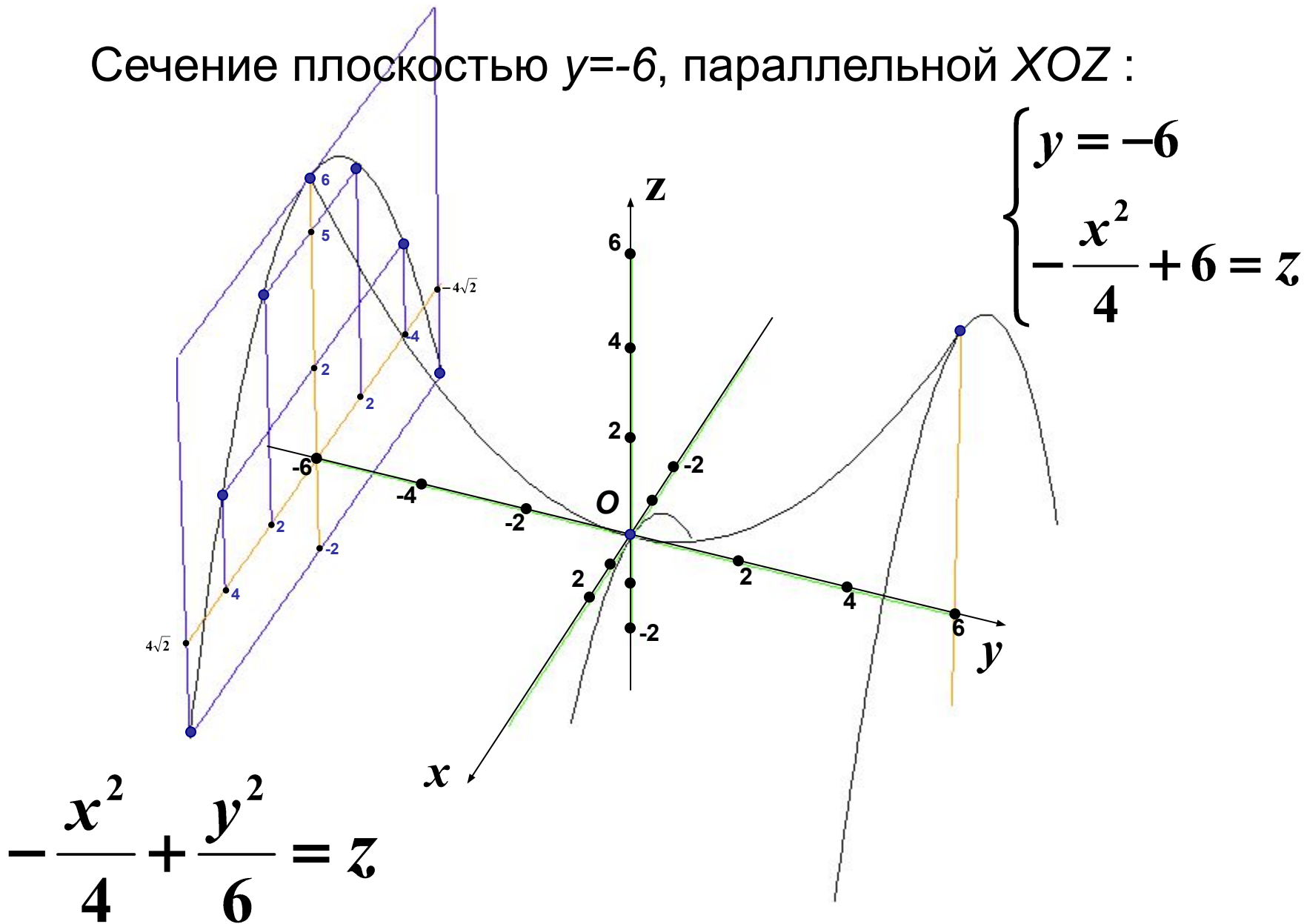
Сечение плоскостью $y=-6$, параллельной XOZ :

$$\begin{cases} y = -6 \\ -\frac{x^2}{4} + 6 = z \end{cases}$$

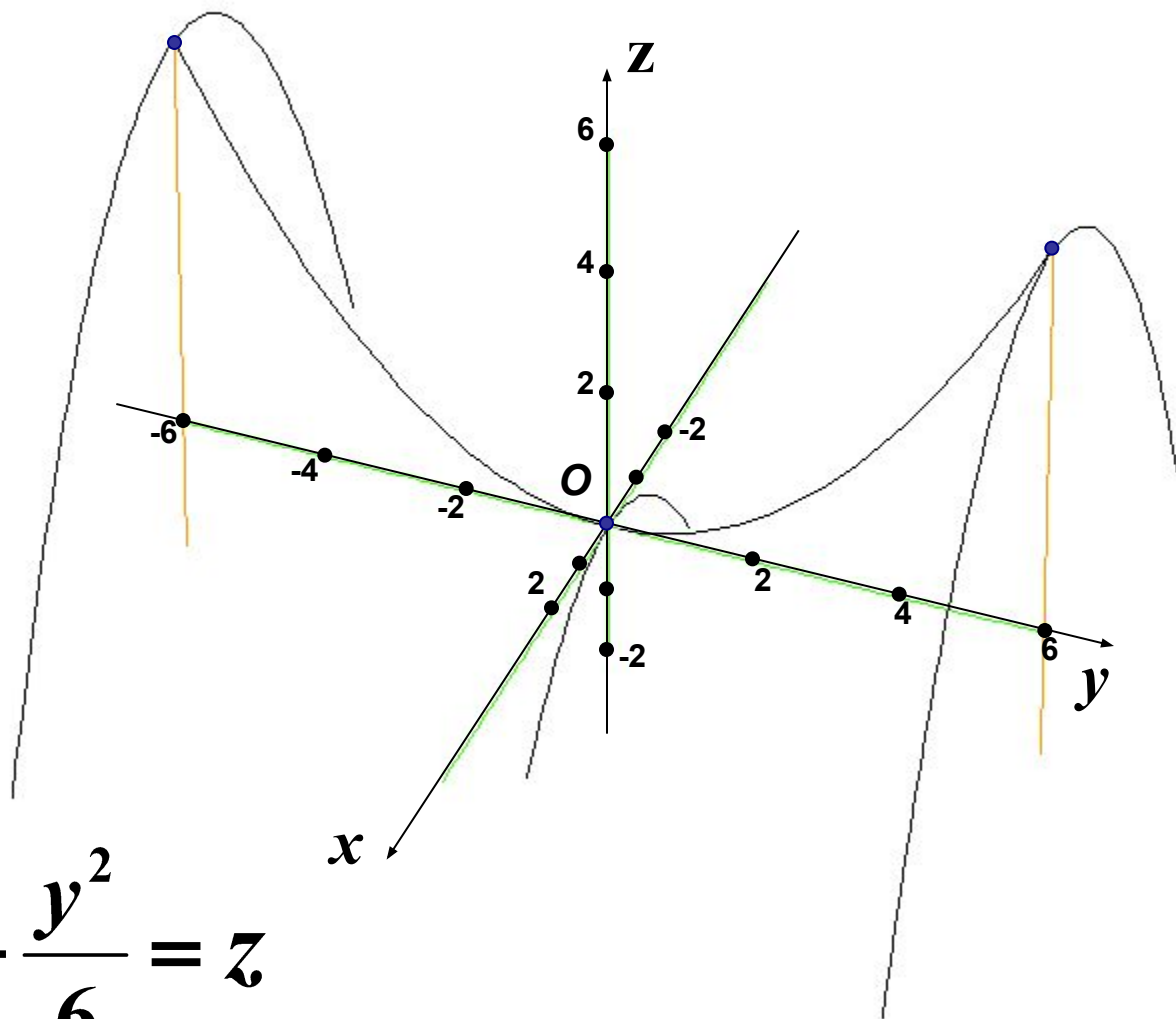


$$-\frac{x^2}{4} + \frac{y^2}{6} = z$$

Сечение плоскостью $y=-6$, параллельной XOZ :



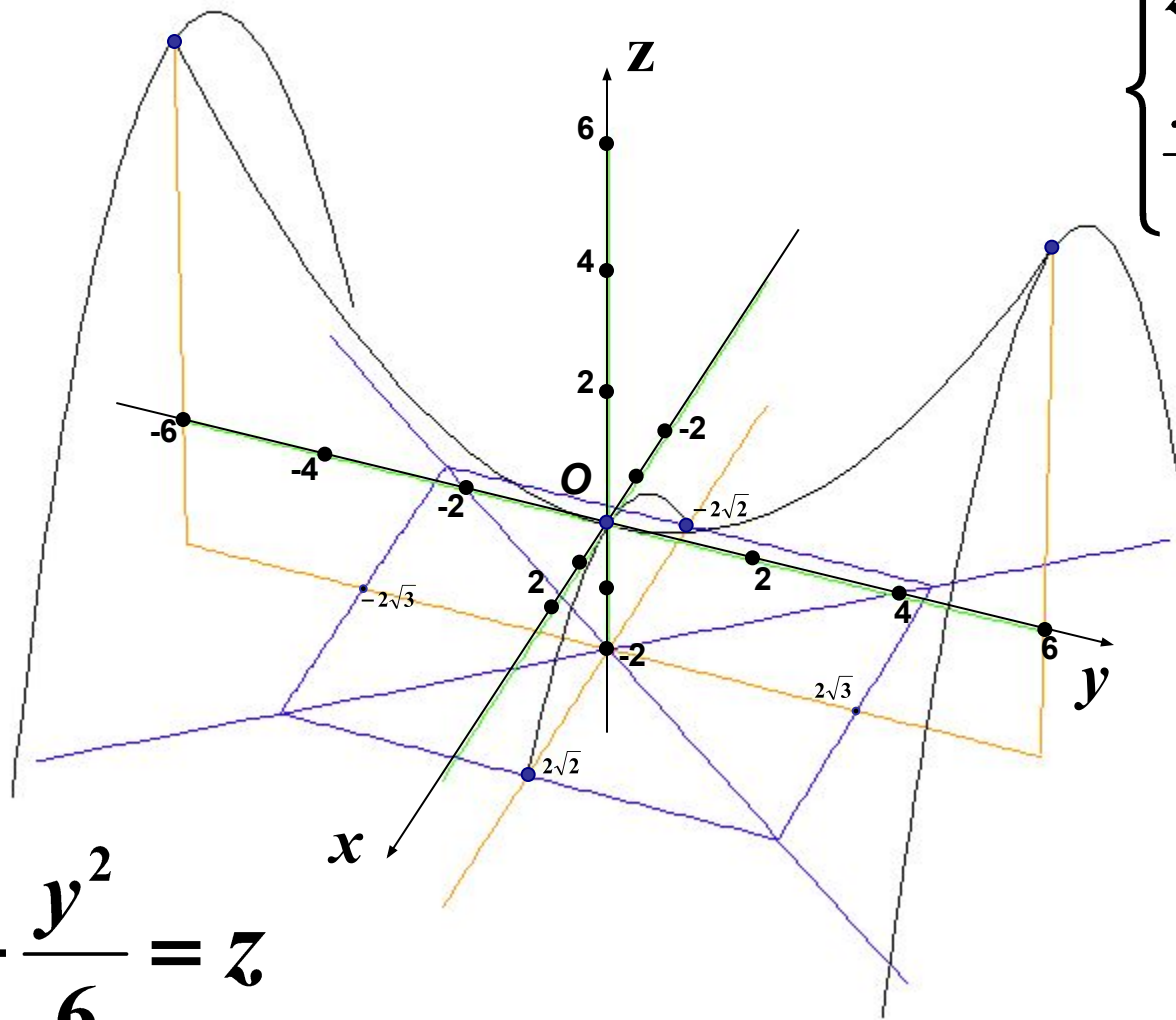
Четыре сечения :



$$-\frac{x^2}{4} + \frac{y^2}{6} = z$$

Сечение плоскостью $z=-2$, параллельной XOY :

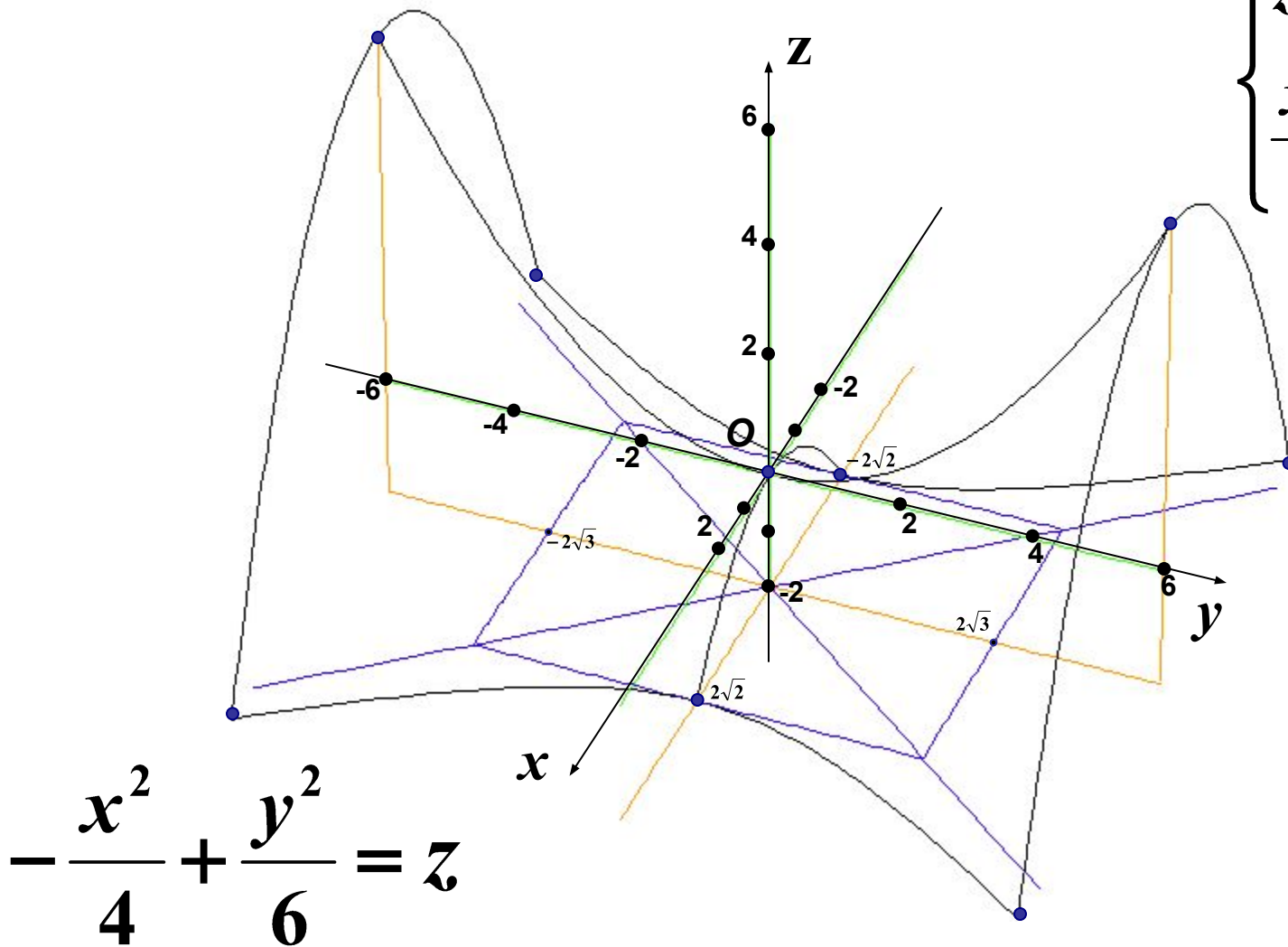
$$\begin{cases} z = -2 \\ \frac{x^2}{8} - \frac{y^2}{12} = 1 \end{cases}$$



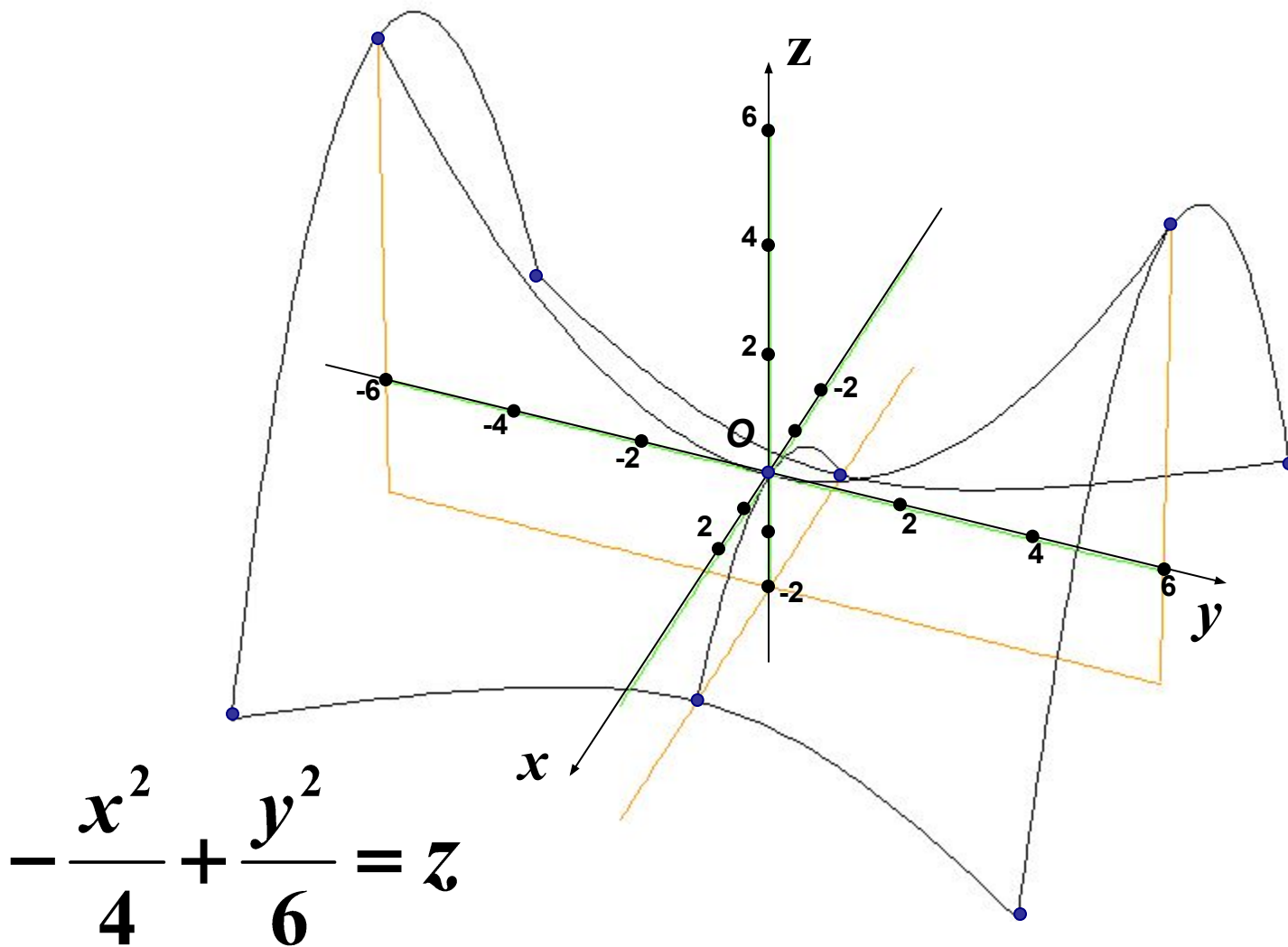
$$-\frac{x^2}{4} + \frac{y^2}{6} = z$$

Сечение плоскостью $z=-2$, параллельной XOY :

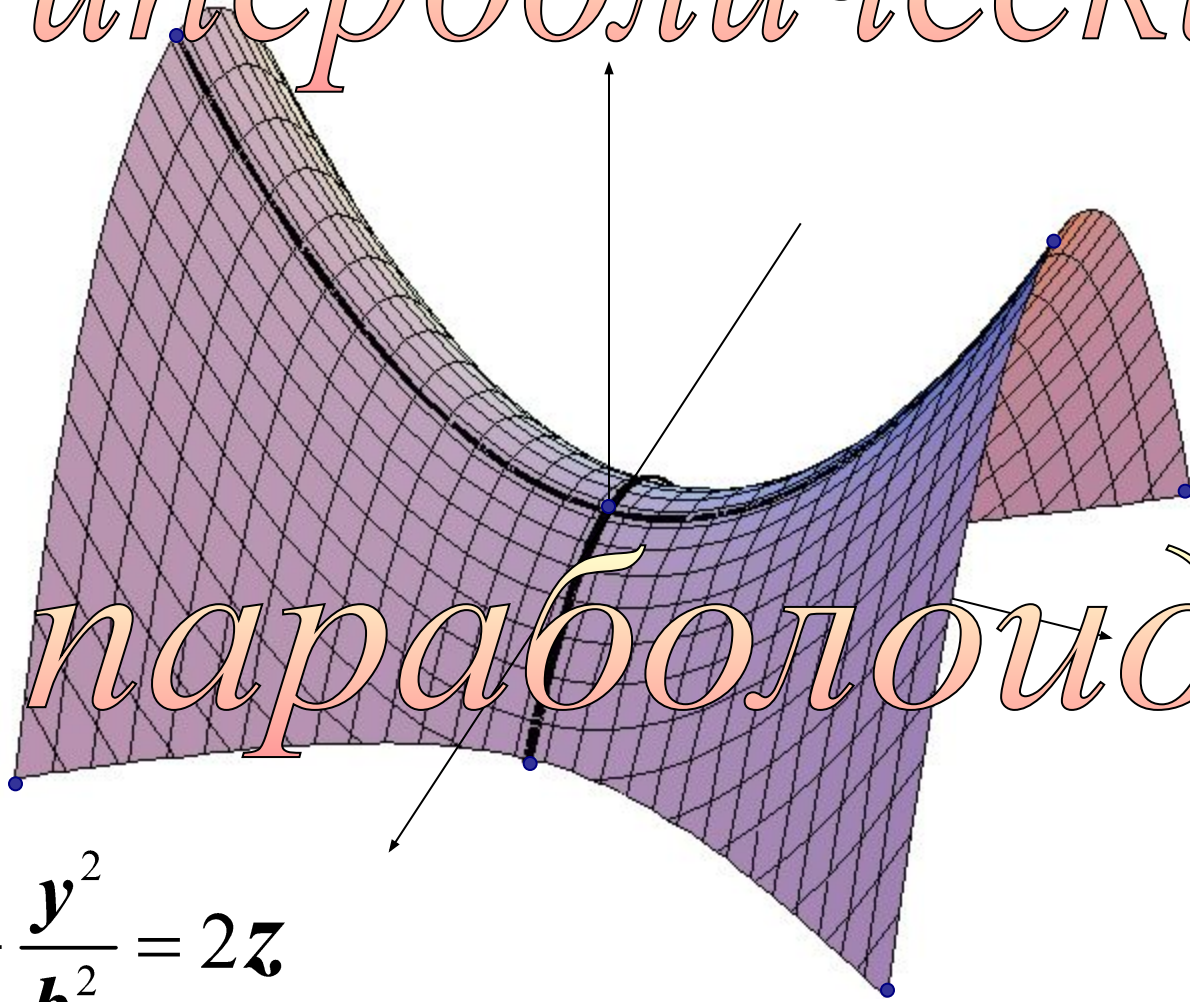
$$\begin{cases} z = -2 \\ \frac{x^2}{8} - \frac{y^2}{12} = 1 \end{cases}$$



Пять сечений :



Гиперболический



параболоид

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