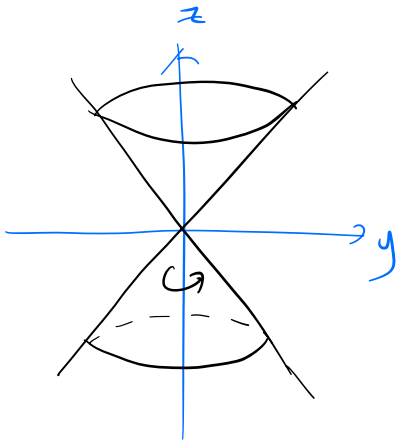
一般地 $\frac{x^2}{a^2}+\frac{y^2}{b^2}-\frac{z^2}{c^2}=-1$

3. 锥面

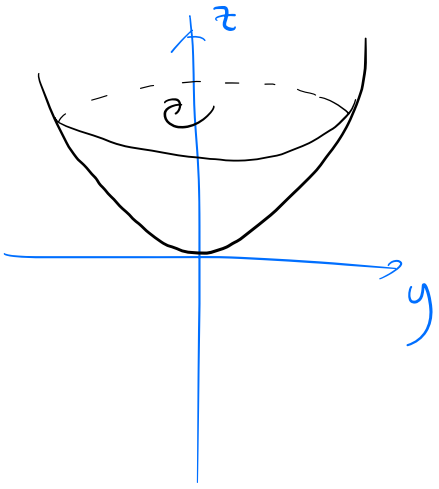


$$\frac{y^2}{a^2}-\frac{z^2}{b^2}=0$$

$$\frac{x^2+y^2}{a^2}-\frac{z^2}{b^2}=0$$

一般地, $\frac{x^2}{a^2}+\frac{y^2}{b^2}-\frac{z^2}{c^2}=0$.

三、抛物面



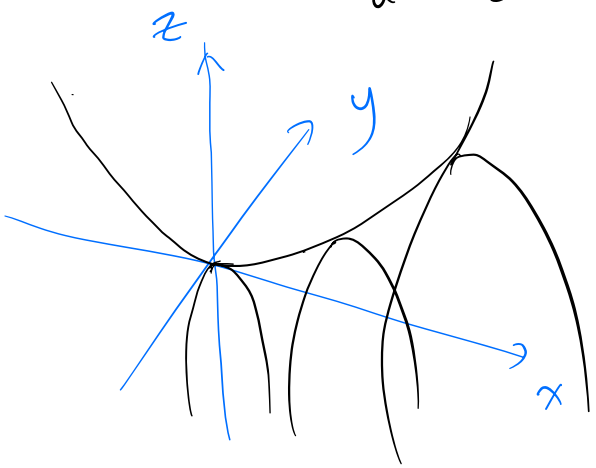
$$z=\frac{y^2}{a^2}$$

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

1. 椭圆抛物面 一般地: $z=\frac{x^2}{a^2}+\frac{y^2}{b^2}$

2. 双曲抛物面

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



例：求直线 $L:\begin{cases}x=2t\\y=k\\z=t\end{cases}$ $k\neq 0$，绕z轴旋转一周生成

旋转曲面方程

$y=k$，　$x=2z$

$P_0(x_0,y_0,z_0)\in L$，旋转到 $P(x,y,z)$

$x_0^2+y_0^2=x^2+y^2$，$z=z_0$

$x_0 = 2t$, $y_0 = k$, $z_0 = t$

$$x^2 + y^2 = (2t)^2 + k^2$$
$$= (2z_0)^2 + k^2$$
$$= 4z^2 + k^2$$

$$\frac{x^2}{k^2} + \frac{y^2}{k^2} - \frac{z^2}{\frac{k^2}{4}} = 1$$ ∴単葉双曲面