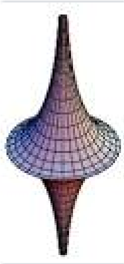
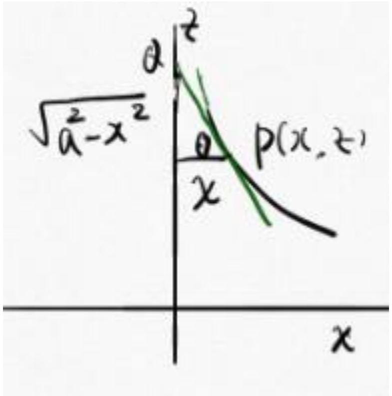


偽球面(pseudosphere)

曳物線(tractrix)C 繞 z 軸的旋轉面



過 P 的切線交 z 軸於 Q, $\overline{PQ}=a$

$$X(r,\theta)=[r\cos\theta, r\sin\theta, f(r)]$$

$$f'(r)=\frac{-\sqrt{a^2-r^2}}{r}$$

$$f''(r)=\ldots=\frac{a^2}{r^2\sqrt{a^2-r^2}}$$

$$X_r=[\cos\theta,\sin\theta, f'(r)]$$

$$X_\theta=[-r\sin\theta, r\cos\theta, 0]$$

$E=1+(f'(r))^2=\dfrac{a^2}{r^2}$, F=0, G=$r^2$

$X_{rr}=[0,0,f''(r)]$, $X_{r\theta}=[-\sin\theta,\cos\theta,0]$, $X_{\theta\theta}=[-r\cos\theta,-r\sin\theta,0]$

$$X_r\times X_\theta=[-r\cos\theta f'(r), -r\sin\theta f'(r), r]$$

$$|X_r\times X_\theta|=r\sqrt{1+(f'(r))^2}$$

$e=-X_{rr}\cdot N=\dfrac{f''(r)}{\sqrt{1+(f'(r))^2}}$, f=0, $g=-X_{\theta\theta}\cdot N=\dfrac{rf'(r)}{\sqrt{1+(f'(r))^2}}$

$$K=\frac{eg}{EG}=\ldots=-\frac{1}{a^2}$$

......

$\begin{cases} x=\operatorname{sech}u\cos v \\ y=\operatorname{sech}u\sin v \\ z=u-\tanh u \end{cases}$, for $u\in(-\infty,\infty), v\in[0,2\pi)$ by Wolfram