the last.

1. $r(t)$ 的 $\alpha,\beta,\gamma,k,\tau$ 公式

(非弧长参数的)

$$\frac{ds}{dt}=|r'(s)|$$

$$\alpha(t)=\frac{r'(t)}{|r'(t)|}$$

$$\gamma(t)=\frac{r'(t)\times r''(t)}{|r'(t)\times r''(t)|}$$

$\beta=\alpha\times\gamma$ (复杂的那个).

$$\tau(t)=\frac{(r'(t),r''(t),r'''(t))}{|r'(t)\times r''(t)|^2}$$

$$k(t)=\frac{r'(t)\cdot r''(t)}{|r'(t)|^3}$$

~~§2.4. 11.题~~

$(e_i\cdot e_j)'=0$ 即解

2. 方程的待定系数法.(P37 课本)

(对特定点进行展开).

本质仍是计算保长对应.

§3.2. 2 ?

§3.3. 5 ✓

§3.5 3 ✓

§4.1 5 ✓

§4.2 4 (3)

§4.2 7

§4.4 9(2).

3. 几类常见曲面参方与正则曲面片 (章三、习题) 利用J

.(待会看).

$$\frac{\partial(u,v)}{\partial(\tilde u,\tilde v)}=\begin{pmatrix}\frac{\partial u}{\partial\tilde u} & \frac{\partial v}{\partial\tilde u}\\ \frac{\partial u}{\partial\tilde v} & \frac{\partial v}{\partial\tilde v}\end{pmatrix}.$$

4. J 的形式的应用

5. 渐近曲线的求法 要么是直线,要么其法面恰与曲面相切.

参见 6. 主曲率求法 法曲率: $\frac{II}{I}$.

15. 7. Gauss曲率的算法:

$$k_1+k_2=\frac{GL-2FM+EN}{EG-F^2}$$

$$k_1\cdot k_2=\frac{LN-M^2}{EG-F^2}$$

又用 $\begin{vmatrix}L-\lambda E & M-\lambda F\\ N-\lambda F & N-\lambda G\end{vmatrix}=0.$

算 $\lambda_1\lambda_2$.

8. 渐伸与渐缩线的方程

$$\begin{cases}\tilde r=r+(s-c)\alpha & (伸)\\ \tilde r=r+\frac{1}{k}\beta-\frac{1}{k}(\tan\int\tau ds)\gamma & (缩).\end{cases}$$

$$\begin{cases}\tilde r=r+(s-c)\alpha\\ \tilde r=r+\frac{1}{k}\beta\mp\frac{1}{k}(\tan\int\tau ds)\gamma.\end{cases}$$

9 $d_1 r \cdot d_2 r = E d_1 u d_2 u + F(d_1 u d_2 v + d_1 v d_2 u) + G d_1 v d_2 v$

10. 7.2.定理. $r_1 = r + \lambda n$

√ 曲线偶

$$\alpha_1 \cdot \frac{d\tilde{s}}{ds} = (1+\lambda k(s))\alpha(s) + \lambda\tau\gamma$$

$\hookrightarrow$ 1. $\left|\frac{d\tilde{s}}{ds}\right|^2 = (1+\lambda k)^2 + (\lambda\tau)^2$

$\hookrightarrow$ 2. $\alpha_1 \cdot \alpha \left|\frac{d\tilde{s}}{ds}\right. = 1+\lambda k(s). = C.$

$$\Rightarrow \frac{d\tilde{s}}{ds} = \sim = C \Rightarrow \lambda k + \mu\tau = 1$$

$\Leftarrow$. $r_1 = r + \lambda\beta.$

$r_1' = \mu\tau\alpha + \lambda\tau\gamma = \alpha_1$ $\qquad \frac{dr_1}{d\tilde{s}}\frac{d\tilde{s}}{ds} = \sim \beta.(s).$

$$= \frac{\mu}{\sqrt{\lambda^2+\mu^2}}\alpha + \frac{\lambda}{\sqrt{\lambda^2+\mu^2}}\gamma$$

11. 曲线偶 $\Leftrightarrow \lambda k + \mu\tau = 1$: 消 $\frac{d\tilde{s}}{ds}$，两个常数作比.（充分性时把 $r_1(s)$ 当一般考虑）

12. 球面曲线 $\Leftrightarrow \sim$: 待定系数法（左右乘 α, β, γ）.

13. $\mathrm{II} \equiv 0 \Leftrightarrow$ 平面 : $n_u, n_v = 0$. $\qquad k_1 \cos^2\theta + k_2 \cos \sin^2\theta = k_n$ ✓

14. Euler公式 : $k_n = k_1 \cos^2\theta + k_2 \sin^2\theta$

其中 θ 有 $e = \cos\theta\, e_1 + \sin\theta\, e_2$.

15. 主方向 & 主曲率计算. $\left|\begin{matrix} L-\lambda E & M-\lambda F \\ N-\lambda F & N-\lambda G \end{matrix}\right| = 0.$

∫2.7 贝特朗曲线. $\qquad$ 3.1①

I 基本 & 主曲率

P61. $\Rightarrow$. $r_2 = r_1 + \lambda\beta$ λ是C

$$\alpha_2 \frac{d\tilde{s}}{ds} = \alpha_1 + \cancel{\lambda'\beta} + \lambda(\sim\beta).$$

$\lambda k + \mu\tau = 1$

$$\left(\frac{d\tilde{s}}{ds}\right)^2 = (1 - \lambda k)^2 + \lambda^2\tau^2$$

$$\overset{C.}{\boxed{\alpha_1\,\alpha_2}}\ \frac{d\tilde{s}}{ds} = 1 - \lambda k.$$

有 $$C = \frac{1-\lambda k}{\sqrt{(1-\lambda k)^2 + \lambda^2\tau^2}} \Rightarrow \underline{1-\lambda k = \mu}.$$

$\Leftarrow$ $\lambda k + \mu\tau = 1$

作 $r_1 = r + \lambda\beta(s).$

$$r_1' = (1-\lambda k)\alpha + \lambda\tau\gamma.$$

$$\alpha_1 = \frac{r_1'}{|r_1'|} = \frac{\mu}{\sqrt{\lambda^2+\mu^2}}\alpha + \frac{\lambda}{\sqrt{\lambda^2+\mu^2}}\gamma$$

$$\frac{d\alpha_1}{d\tilde{s}}\frac{d\tilde{s}}{ds} = \frac{\mu k}{\sim}\beta + \frac{\lambda\tau}{\sim}\beta.$$