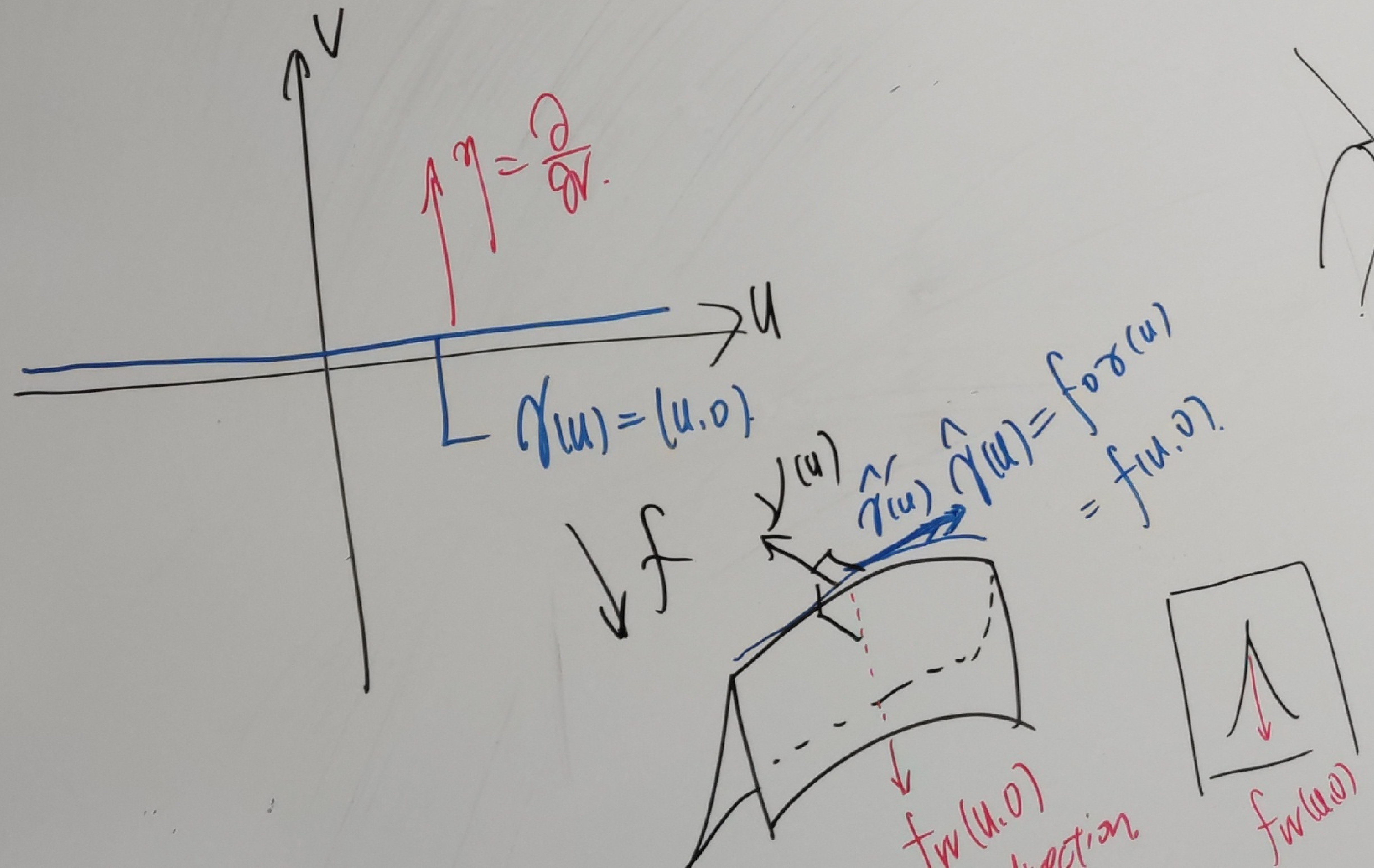
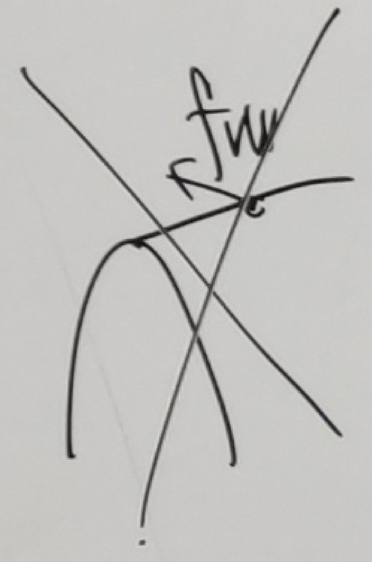
$m=2$

f: gen. cuspidal edge.

$\Longrightarrow \exists (U; u,v)$: $\underset{(0,0)}{p}$ を中心とする coord.

s.t. $\begin{cases} \cdot\ (u,0) \text{ が特異曲線.} \\ \cdot\ f_v(u,0) = 0 \\ \cdot\ \{f_u(u,0), f_{vv}(u,0), \nu(u,0)\} \text{ が ONB.} \end{cases}$





m: 偶数

f: m-type edge at p

$\Longrightarrow \exists (U; u,v)$: $\underset{(0,0)}{p}$ を中心とする coord

s.t. $\begin{cases} \cdot\ (u,0) \text{ が特異曲線.} \\ \cdot\ f_v(u,0) = \cdots = f_{v^{m-1}}(u,0) = 0 \\ \cdot\ \{f_u(u,0), f_{v^m}(u,0), \nu(u,0)\}: \text{ONB.} \end{cases}$

Def. $x(u) := f_{v^m}(u,0)$

を cuspidal direction という.

HW この場合も

$\kappa_s = \kappa \cos\theta$ は成立するか?

$$f_v = v^{m-1}\psi(u,v)$$

$$f_{v^m}(u,0) = (m-1)!\,\psi(u,0).$$

$$\therefore\ \psi(u,0) = \frac{1}{(m-1)!} f_{v^m}(u,0) = \frac{1}{(m-1)!}\,x(u).$$

$$\lambda = \det(f_u,\ f_v,\ \nu)$$

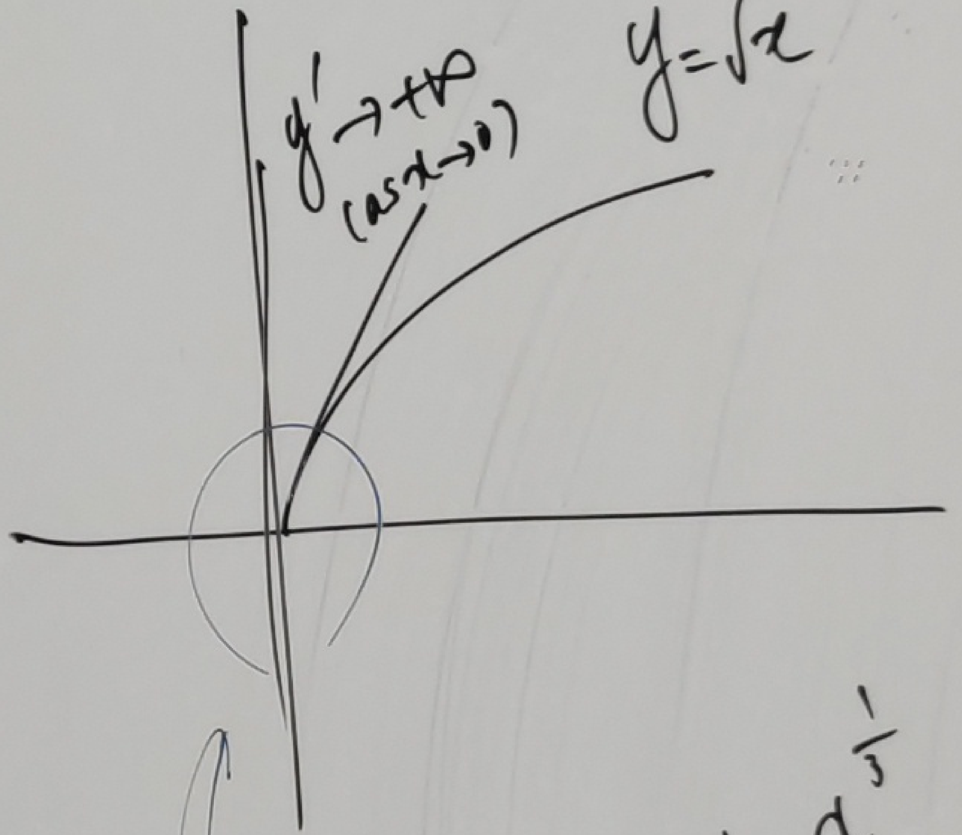
$$= v^{m-1}\cdot\det(f_u,\psi,\nu) = \hat{\lambda}^{m-1}$$

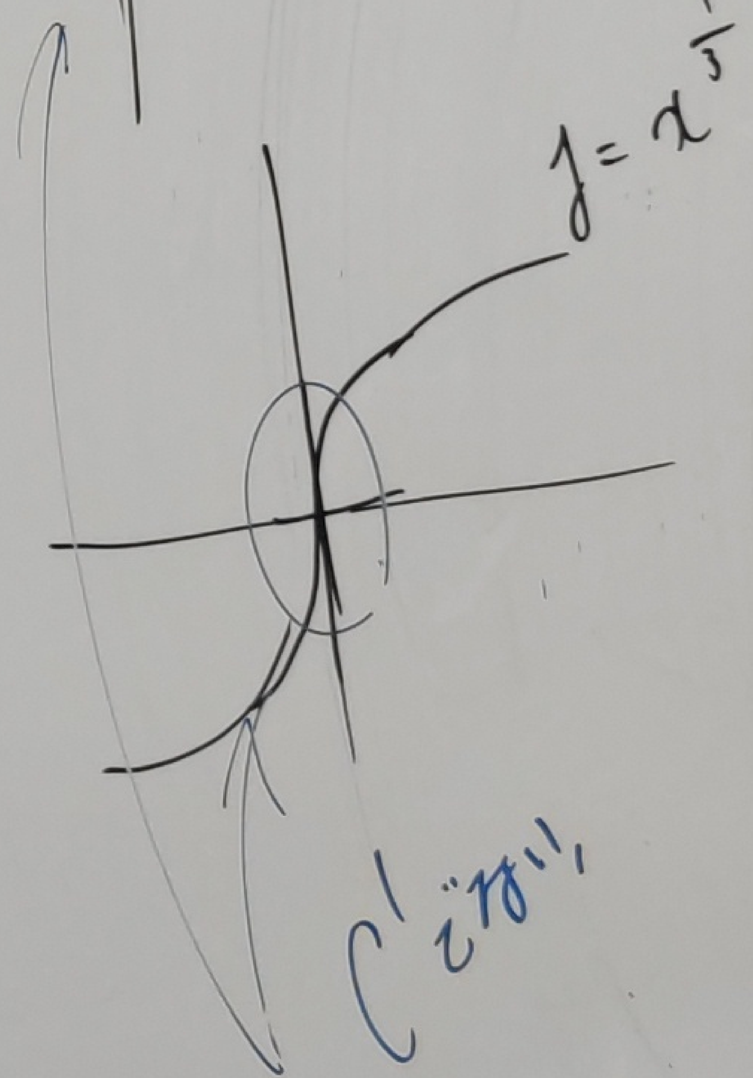
$$\hat{\lambda} := \boxed{v\cdot\{\underbrace{\det(f_u,\psi,\nu)}_{\neq 0}\}^{\frac{1}{m-1}}}\ :\ C^\infty\text{級}$$

$m-1$: 奇より

$\det(f_u,\psi,\nu)$ の符号によらず

$(m-1)$ 乗根がとれる.





$$\eta^{m-1}\lambda(u,0) = \lambda_{v^{m-1}}(u,0)$$

$$= (m-1)!\cdot\det(f_u,\psi,\nu)(u,0)$$

$$= \cancel{(m-1)!}\,\det\left(\hat{\gamma}'(u),\ \cancel{\frac{1}{(m-1)!}}\,x(u),\ \nu(u,0)\right)$$

$$= \det\left(e(u),\ \cos\theta\, n(u) - \sin\theta\, b(u),\ \sigma(\sin\theta\, n + \cos\theta\, b)\right)$$

$$= \sigma.$$