$C_a : \; y = ax^2$

$ax^2 - y = 0$

$C'_a : \; y = ax^3$

$ax^3 - y = 0$

$$\begin{cases} ax^3 - y = 0 \\ ax^2 - y = 0 \end{cases}$$

$$\begin{vmatrix} x^3 & -y \\ x^2 & -y \end{vmatrix} = -x^3y + x^2y$$

luogo: $x^2y(1-x) = 0$

$$\begin{array}{l|l} ax^3 - y & ax^2 - y \\ \cline{2-2} -ax^3 + xy & x \\ \hline // \quad xy - y & \end{array}$$

$xy - y = 0$

$y(x-1) = 0$

$ax^2 - y = 0 \qquad ax^3 - y = 0$

$a = \frac{p}{q}$

$px^2 - qy = 0 \qquad px^3 - qy = 0$

Piano tangente: $\qquad \bar{P} \equiv (\bar{x}, \bar{y}, \bar{z})$

$$(x-\bar{x}) \cdot f'_x(\bar{P}) + (y-\bar{y}) f'_y(\bar{P}) + (z-\bar{z}) \cdot f'_z(\bar{P}) = 0$$

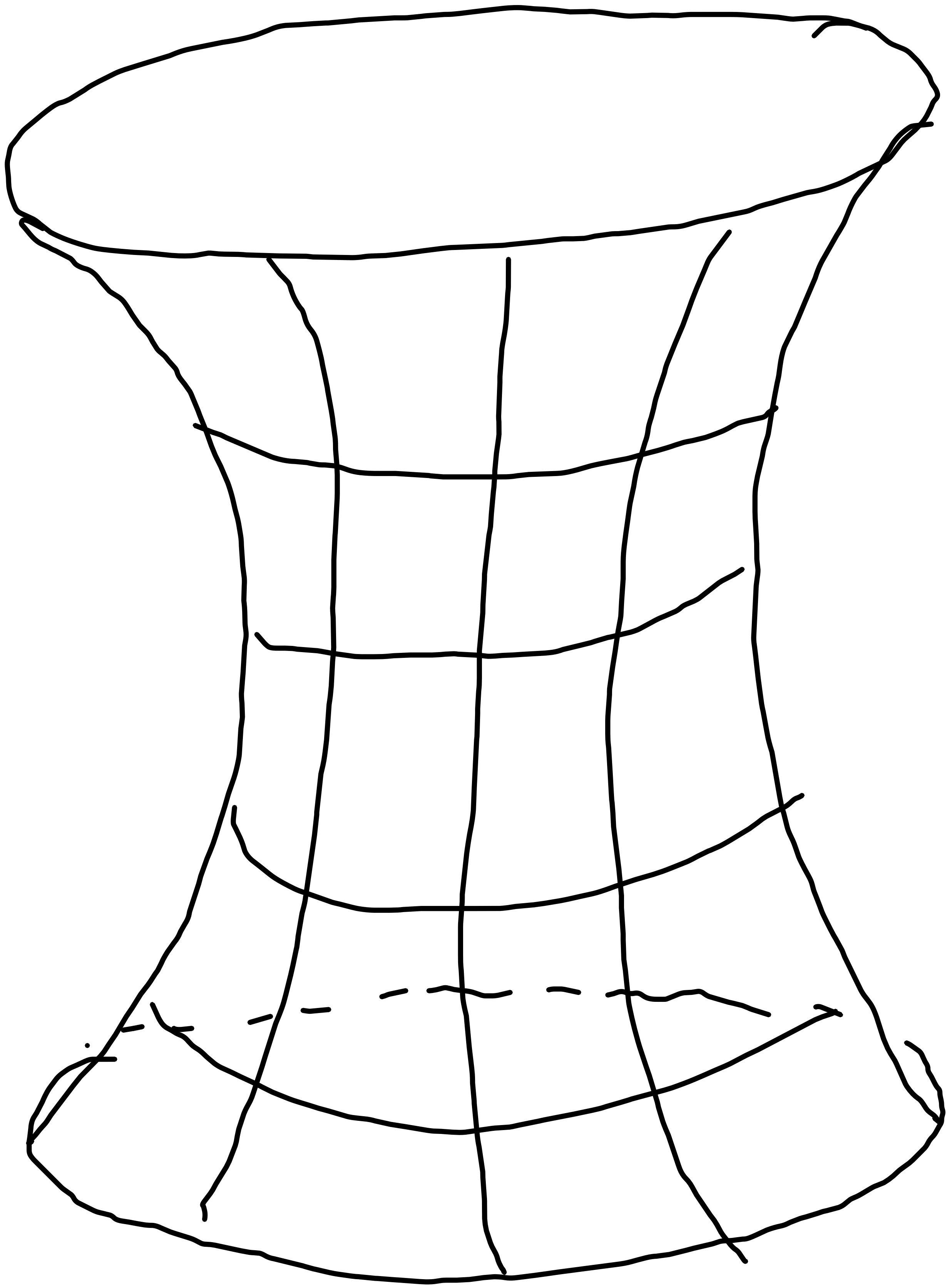
Retta normale:

$$\frac{x-\bar{x}}{f'_x(\bar{P})} = \frac{y-\bar{y}}{f'_y(\bar{P})} = \frac{z-\bar{z}}{f'_z(\bar{P})} \qquad \begin{cases} x = \bar{x} + u f'_x(\bar{P}) \\ y = \bar{y} + u f'_y(\bar{P}) \\ z = \bar{z} + u f'_z(\bar{P}) \end{cases}$$

$$\left\{ (x, y, z) \in \mathbb{R}^3 \;\middle|\; x^2 - 1 = a \right\}$$

$$\left\{ (x, y) \in \mathbb{R}^2 \;\middle|\; x^2 - 1 = a \right\}$$

$$\left\{ x \in \mathbb{R} \;\middle|\; x^2 - 1 = a \right\}$$



ES $10_{b,c}$ $\mathcal{C}$: $\begin{cases} z=0 \\ y=x^2 \end{cases}$ Scrivere eq. del cono avente $\mathcal{C}$ come direttrice e $V\equiv(0,0,1)$ come vertice e del cilindro avente $\mathcal{C}$ come direttrice e generatrici parallele a r : $\begin{cases} x=2y \\ z=y-1 \end{cases}$

$\mathcal{C}$: $\begin{cases} x=u \\ y=u^2 \\ z=0 \end{cases}$

$(l,m,n)\sim(2,1,1)$

$P_u\equiv(u,u^2,0)$

b [cono] Retta VP_u : $\frac{x-0}{u-0} = \frac{y-0}{u^2-0} = \frac{z-1}{0-1}$

$$\frac{x}{u} = \frac{y}{u^2} = \frac{z-1}{-1} = v$$

$$\begin{cases} x = uv \\ y = u^2 v \\ z = 1 - v \end{cases} \qquad \begin{cases} x = uv \\ y = u^2 v \\ v = 1 - z \end{cases} \qquad \begin{cases} x = u(1-z) \\ y = u^2(1-z) \end{cases} \qquad \begin{cases} u = \frac{x}{1-z} \\ y = u^2(1-z) \end{cases}$$

$$y = \frac{x^2}{(1-z)^{\cancel{2}}} \cancel{(1-z)} \qquad y(1-z) - x^2 = 0 \qquad y - yz - x^2 = 0$$

$$\begin{cases} x = u(1-z) \\ y = u^2(1-z) \end{cases}$$

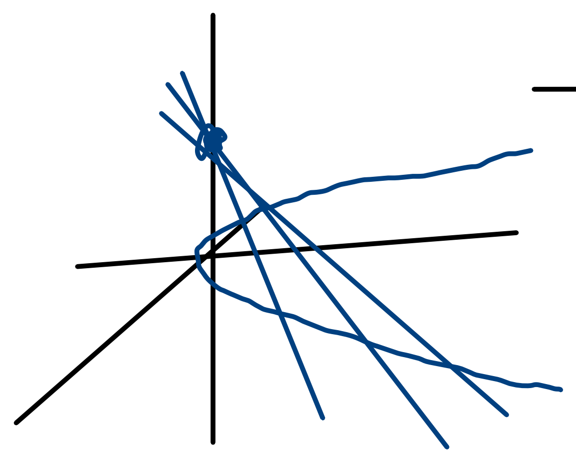
$$\begin{cases} u^2(1-z) - y = 0 \\ u(1-z) - x = 0 \end{cases}$$

$$\begin{vmatrix} (1-z) & 0 & -y \\ (1-z) & -x & 0 \\ 0 & (1-z) & -x \end{vmatrix} = 0$$

$$-(z-1)(yz - y + x^2) = 0$$

$$\begin{array}{l|l} u^2(1-z) - y & u(1-z) - x \\ \cline{2-2} -u^2(1-z) + ux & u + \dfrac{x}{1-z} \\ \hline \qquad ux - y & \\ \qquad -ux + \dfrac{x^2}{1-z} & \\ \hline \qquad \dfrac{x^2}{1-z} - y & \end{array}$$

$$\frac{x^2 - y + yz}{1-z} = 0$$



c (cilindro) $\quad P_u \equiv (u, u^2, 0) \quad (l, m, n) \sim (2, 1, 1)$

Retta per P_u, $\parallel$ a r: $\quad \dfrac{x-u}{2} = \dfrac{y-u^2}{1} = \dfrac{z-0}{1} = v$

$$\begin{cases} x = u + 2v \\ y = u^2 + v \\ z = v \end{cases} \qquad \begin{cases} x = u + 2z \\ y = u^2 + z \end{cases} \qquad \begin{cases} u = x - 2z \\ y = u^2 + z \end{cases}$$

$$y = (x-2z)^2 + z \qquad x^2 + 4z^2 - 4xz + z - y = 0$$

ES 10 a $C : \begin{cases} z = 0 \\ y = x^2 \end{cases}$

Trovare la sup. di rot. Σ_1 ottenuta facendo ruotare C attorno all'asse y

$f(x, y) = x^2 - y$ $\Sigma_1 : f\left(\pm\sqrt{x^2+z^2}, y\right) = 0$ $x^2 + z^2 - y = 0$

$\left(\pm\sqrt{x^2+z^2}\right)^2 - y = 0$

Trovare - - - - - - - - Σ_2 - - - - - - - attorno all'asse x

$f(x, y) = x^2 - y$ $\Sigma_2 : f\left(x, \pm\sqrt{y^2+z^2}\right) = 0$

$x^2 - \left(\pm\sqrt{y^2+z^2}\right) = 0$

$(x^2)^2 = \left(\left(\pm\sqrt{y^2+z^2}\right)\right)^2$ $x^4 = y^2 + z^2$