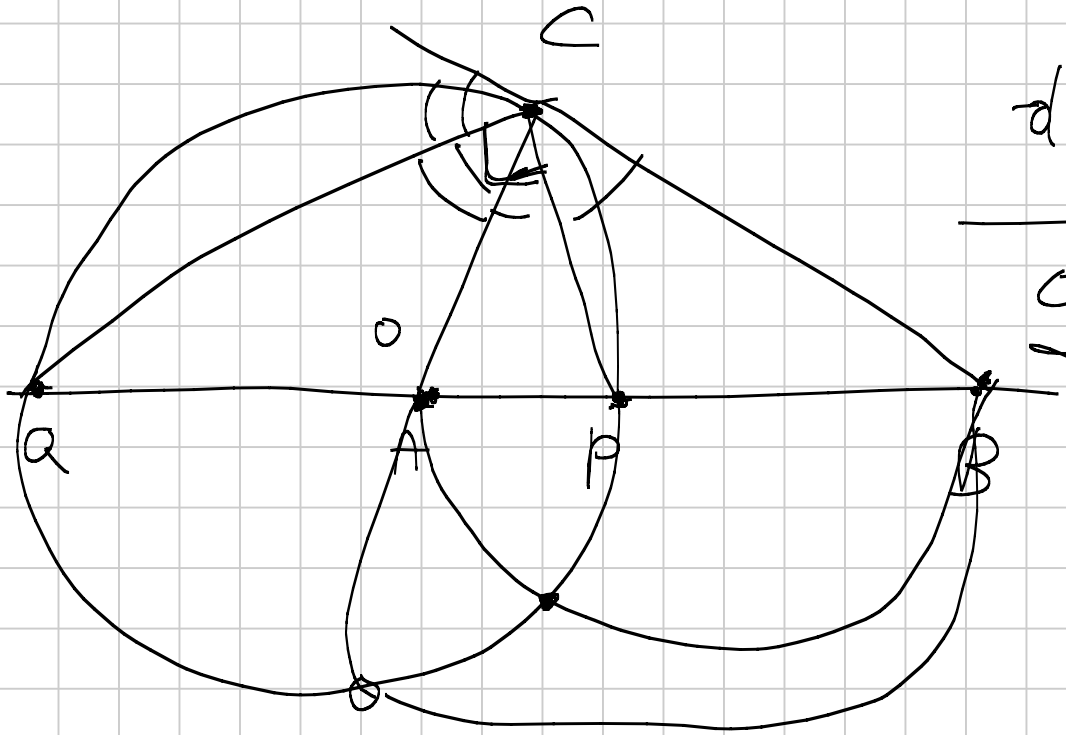
Note Title 05/09/2023

SENIOR AZ ADVANCED

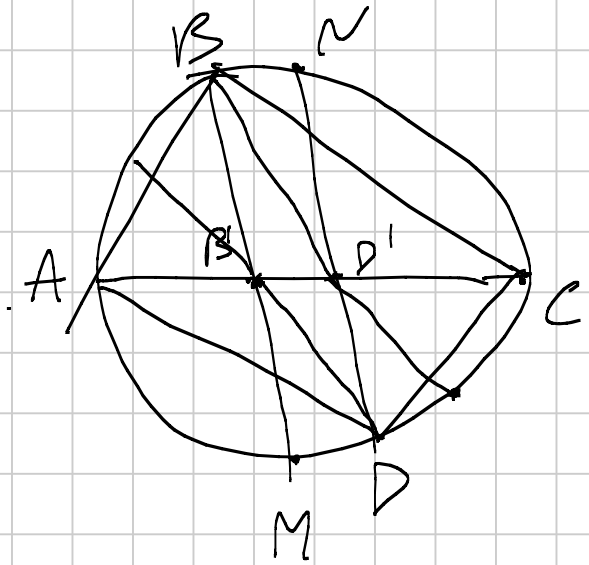
Note Title 05/09/2023

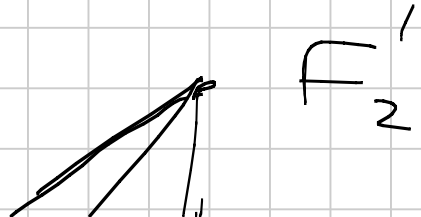
$(A \Rightarrow B) \in (B \Rightarrow A)$

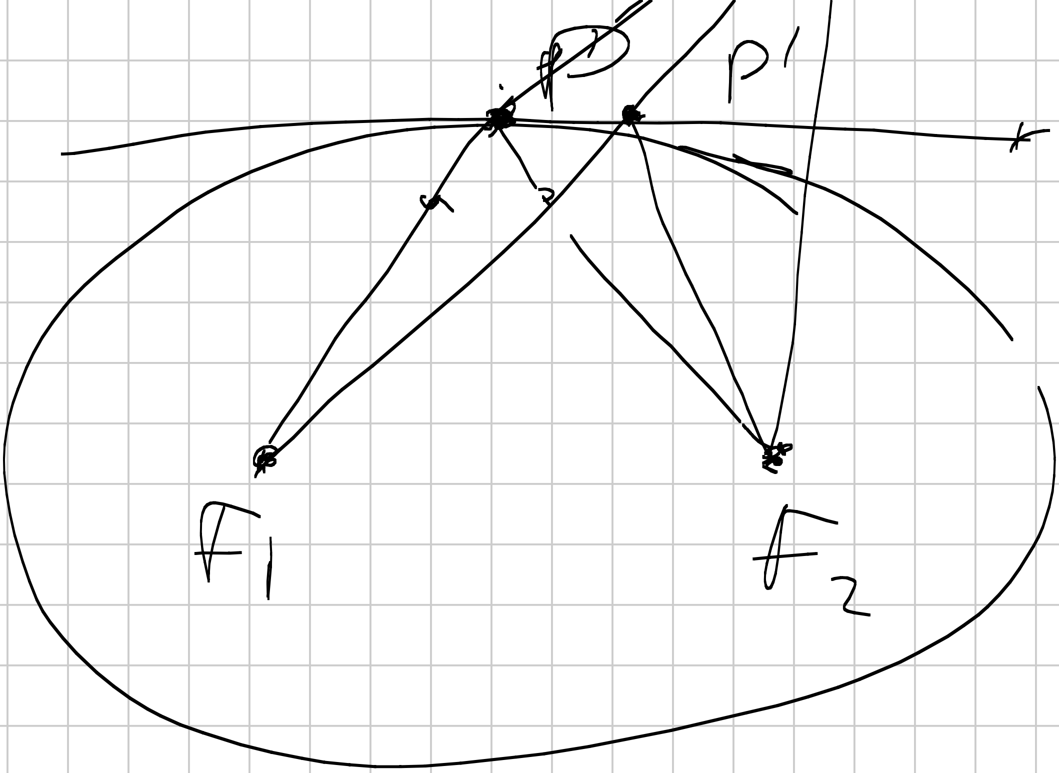


$$\frac{d(A)}{d(S)}$$

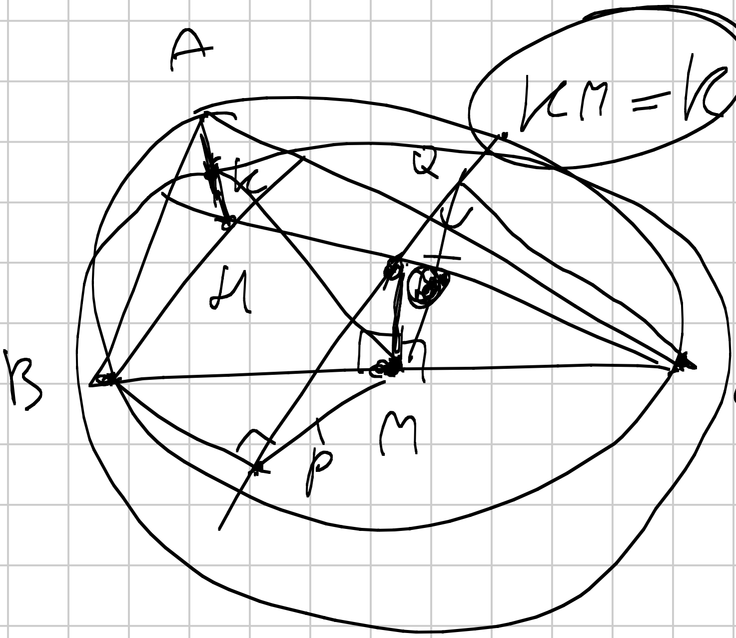
IMO SL5 2021







RMM 4 2023

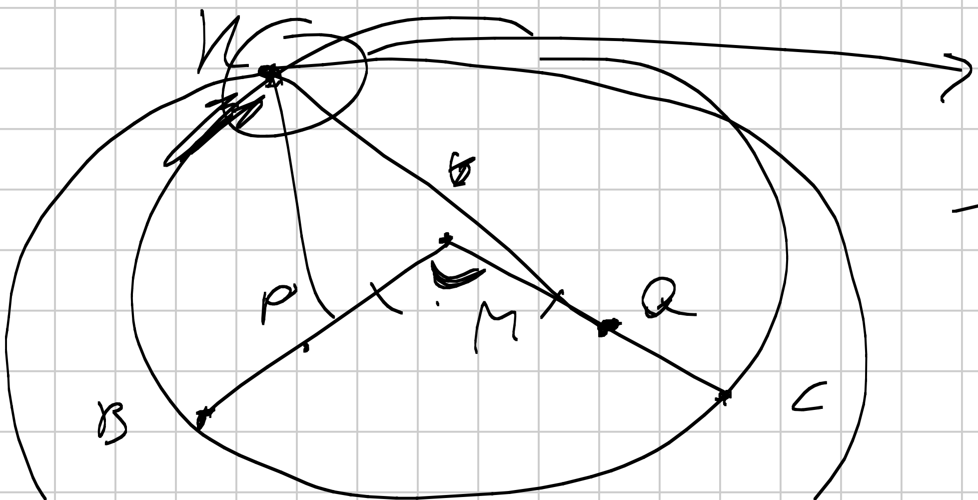


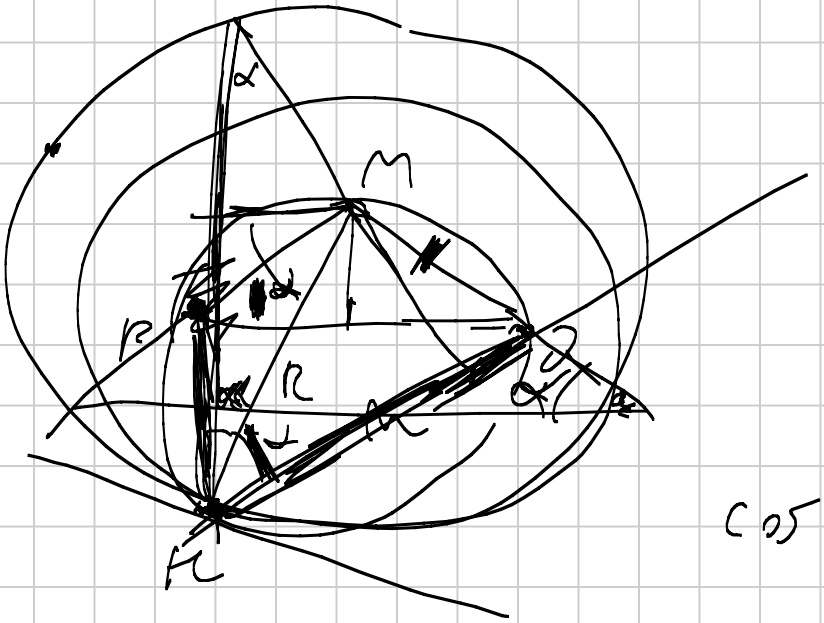
$KM = R$

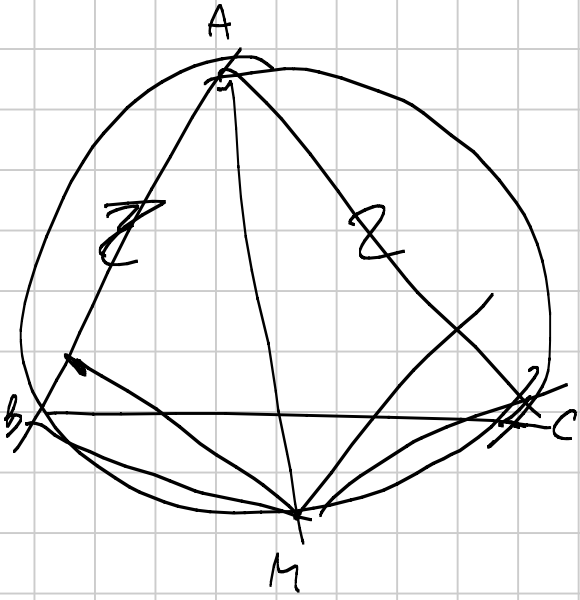
$\overrightarrow{AK} = \overrightarrow{OM}$

$MP = MQ$

$\widehat{PMQ} \cong \widehat{BCO}$

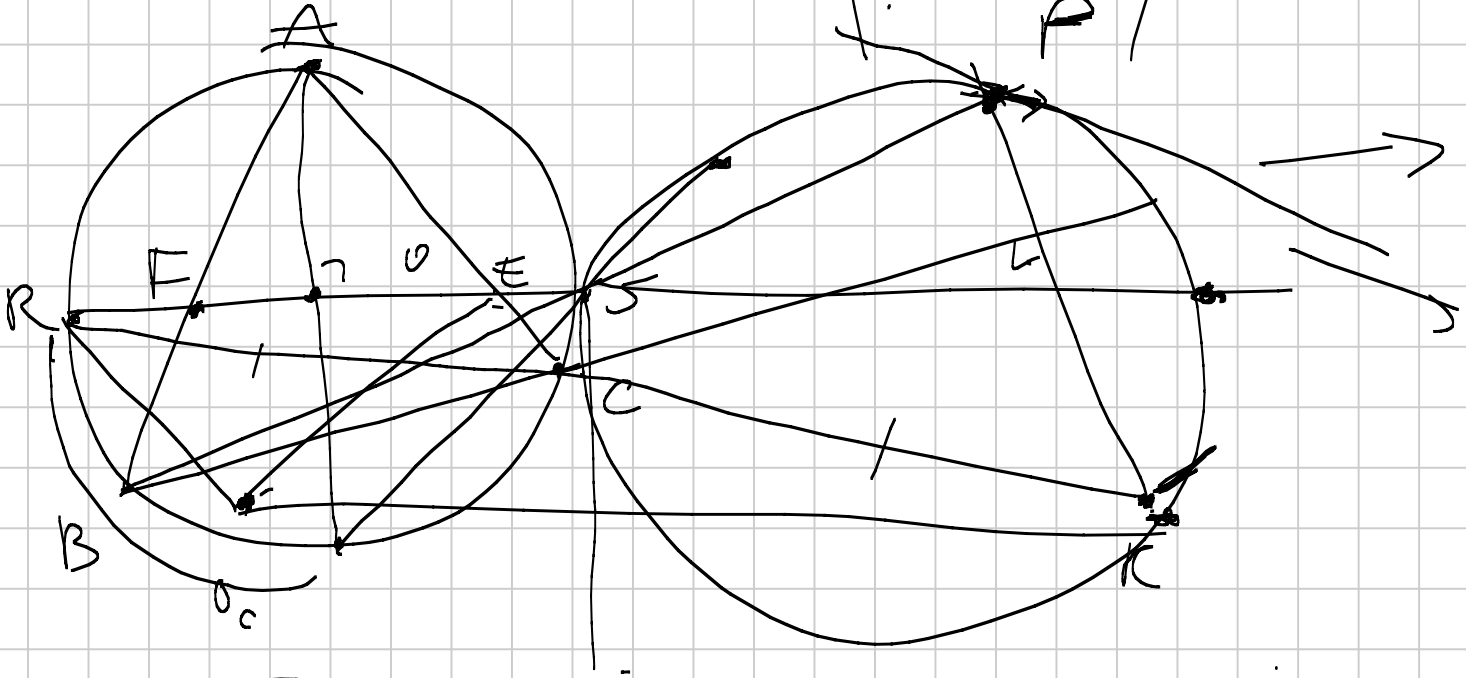






$\cos\alpha$

IGO P5 2022

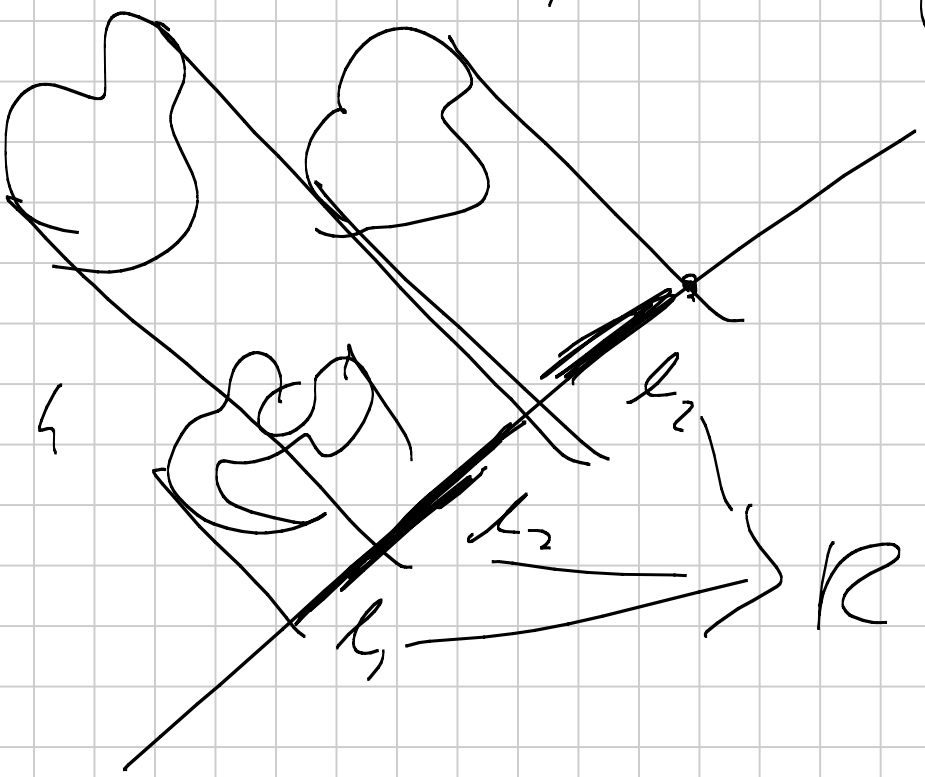


$$\frac{\partial f}{\partial x} \qquad \frac{\partial f}{\partial y}$$

РОСЧА

$f(z)$, z $\quad n \geq 1$ $\quad C = \{z \mid |f(z)| \leq 2\}$ T.C.

$|f| \leq 2$



$l_1 + l_2 + l_3 + \ldots \leq 4$

$f(x)$, $x \in R$, $x \in [-1, 1]$

$n = deg(f)$

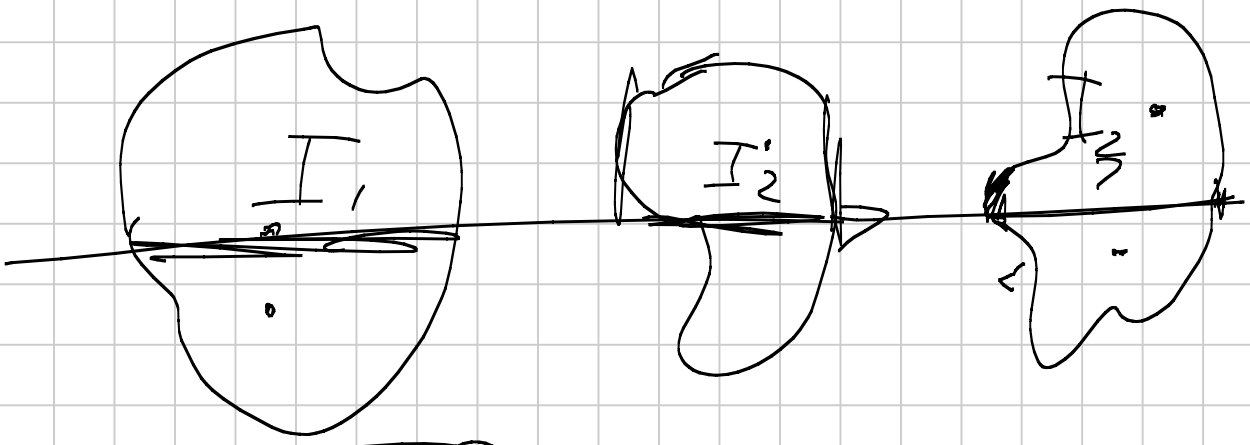
$MAX(|f(x)|) \geq \boxed{\frac{1}{2^{n-1}}}$

$$f(x) \longrightarrow 2^n f(x/2) = g(x)$$

$$\frac{1}{2^n} g(2x) \longleftarrow g(x)$$

$$[-2, 2] \qquad \max |g(x)| \geq 2$$

$f(z)$



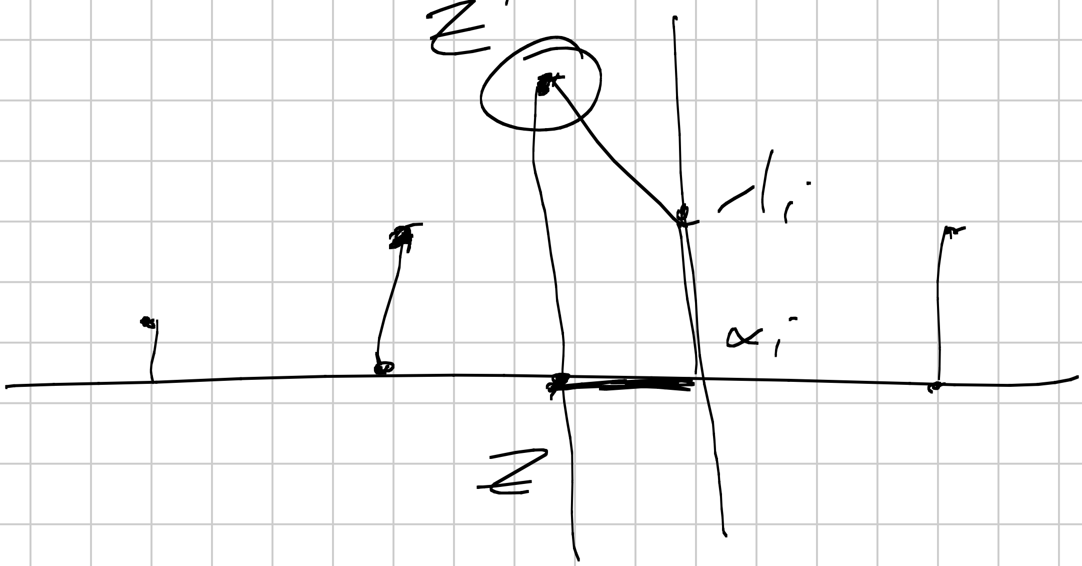
$$f(z) = (z-\lambda_1)(z-\lambda_2)\cdots(z-\lambda_4)$$

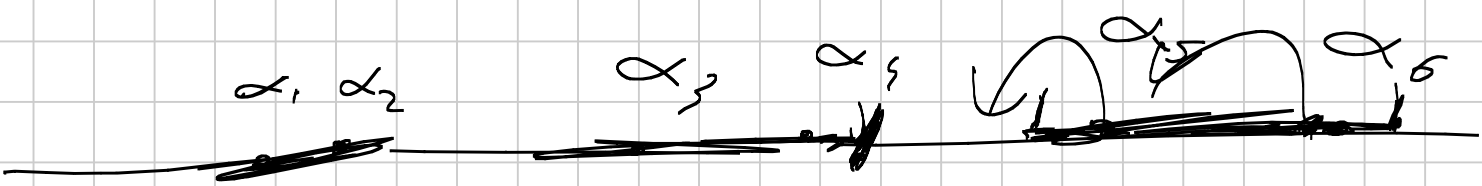
$$\boxed{Re(z)}$$

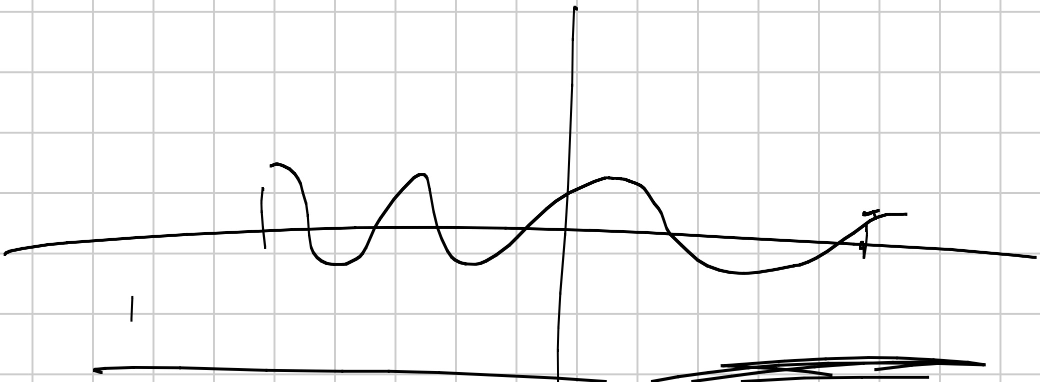
$\lambda_1, \lambda_2, \lambda_3, \ldots, \lambda_n$

$\mathbb{C}$

$\underset{\alpha_1}{\underline{\underline{Re(\lambda_1)}}}, \underset{\alpha_2}{\underline{\underline{Re(\lambda_2)}}}, \underset{\alpha_3}{\underline{\underline{Re(\lambda_3)}}}, \ldots, \underset{\alpha_n}{\underline{\underline{Re(\lambda_n)}}}$







$f(x)$ $[-1, 1]$

$f(\cos(x))$ $\times$ $\|f(\cos(x))\| \geq \frac{1}{2^{n-1}}$

$\sim \cos(nx)$

$$\cos(x)^n + a_{n-1}\cos(x)^{n-1} + \dots + a_0$$

$$\cos x = \frac{e^{ix} + e^{-ix}}{2}, \quad \cos nx = \frac{e^{inx} + e^{-inx}}{2}$$

$$\cos(x)^n = \left(\frac{e^{ix} + e^{-ix}}{2}\right)^n = \frac{e^{inx}}{2^n} + \frac{e^{-inx}}{2^n} + \dots$$

($\frac{1}{2^{n-1}}\cos nx$)

$\cos(x)$

$e^{ixk} \cdot e^{-ik(n-k)} =$

e^{i+c}

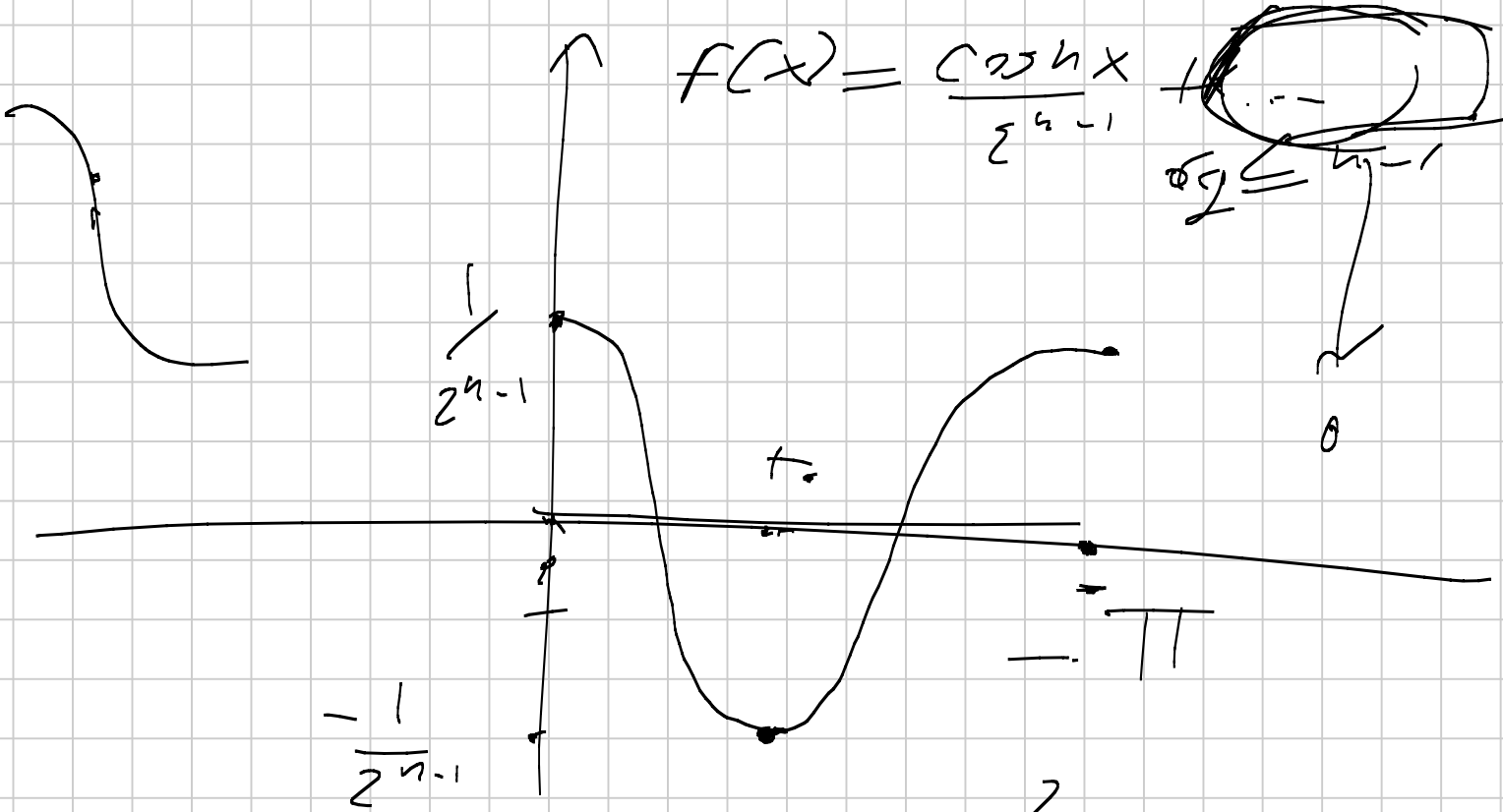
$\cos nx = \cos^n x + \dots \cos k_1 x + \cos k_2 x$

$$\cos^n x = \frac{\cos nx}{2^{n-1}} + a_{n-1}\cos(n-1)x + \dots$$

$$T_n(\cos(x)) = \frac{\cos nx}{2^{n-1}}$$

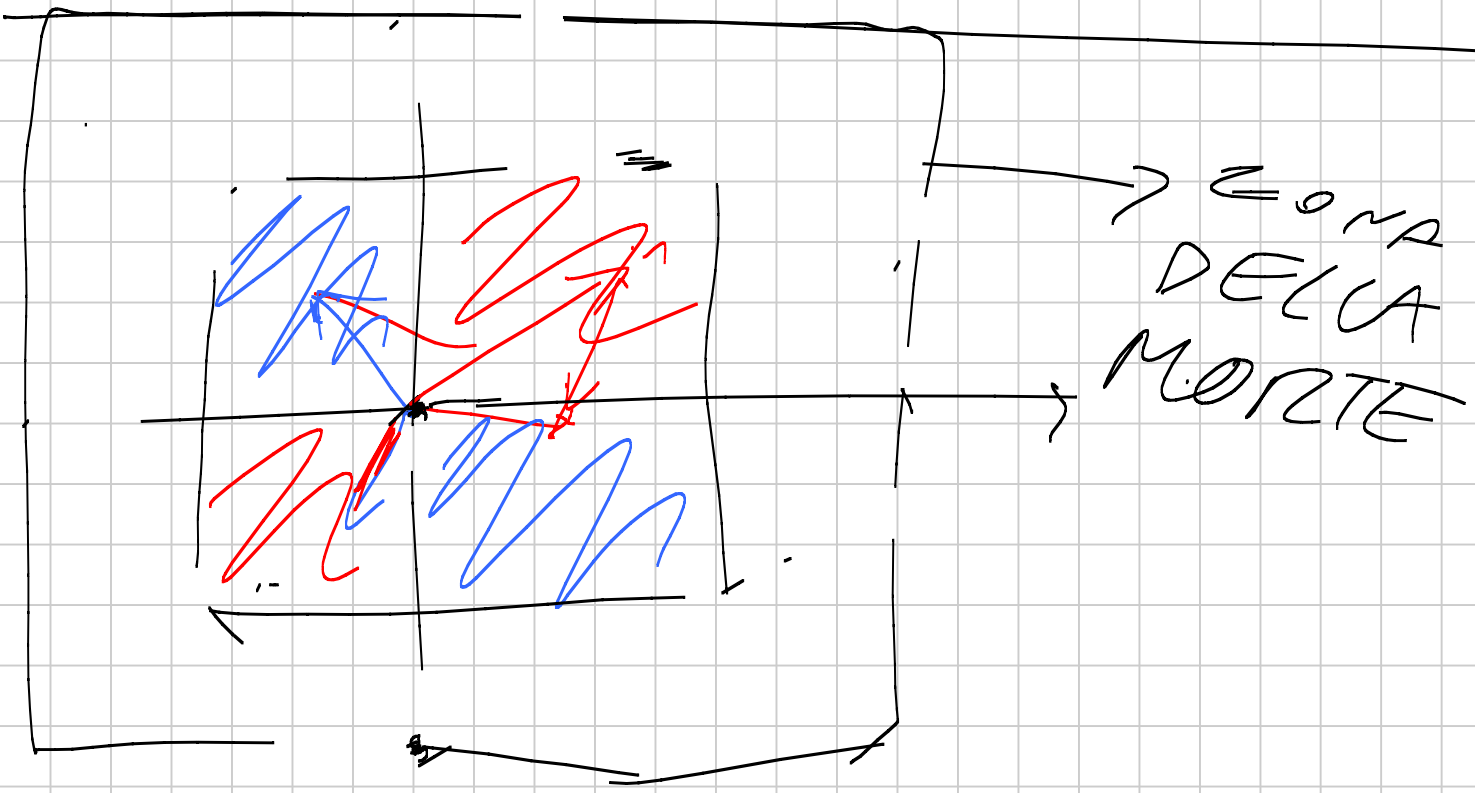
$$f(x) = \frac{\cos nx}{2^{n-1}} + \dots$$

$\deg \le n-1$



$f(x)$ | $|f(x)| \le \frac{1}{2^{n-1}}$ $x \in [-1,1]$

$T_n(x) = \cos n\alpha \qquad \cos\alpha = x$



BEZOUT

γ curva algebrica

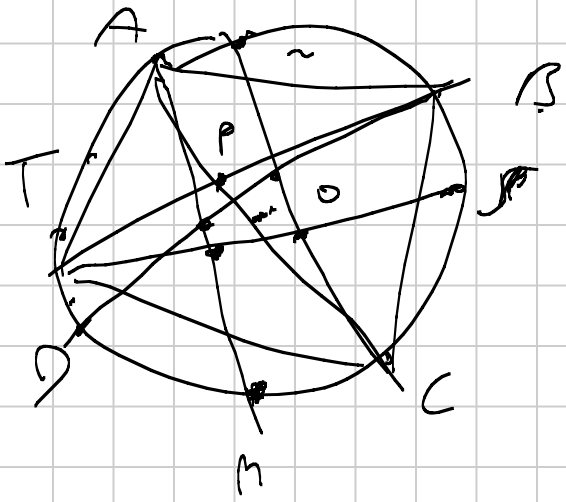
2D grado n è l'insieme delle soluzioni di un polinomio $p(x,y)=0$

γ_1, γ_2, $\deg(\gamma_1)=n$, $\deg(\gamma_2)=m$

si intersecano in al più $n \times m$ punti

oppure in infiniti e in particolare

$\exists\ p(x,y)$. | p | γ_1, γ_2

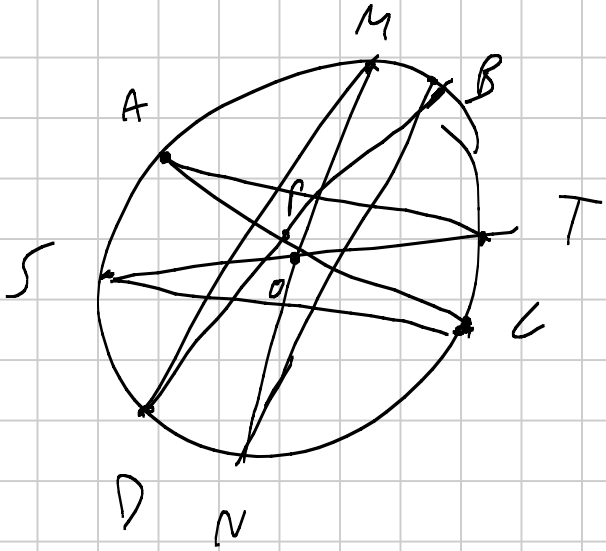


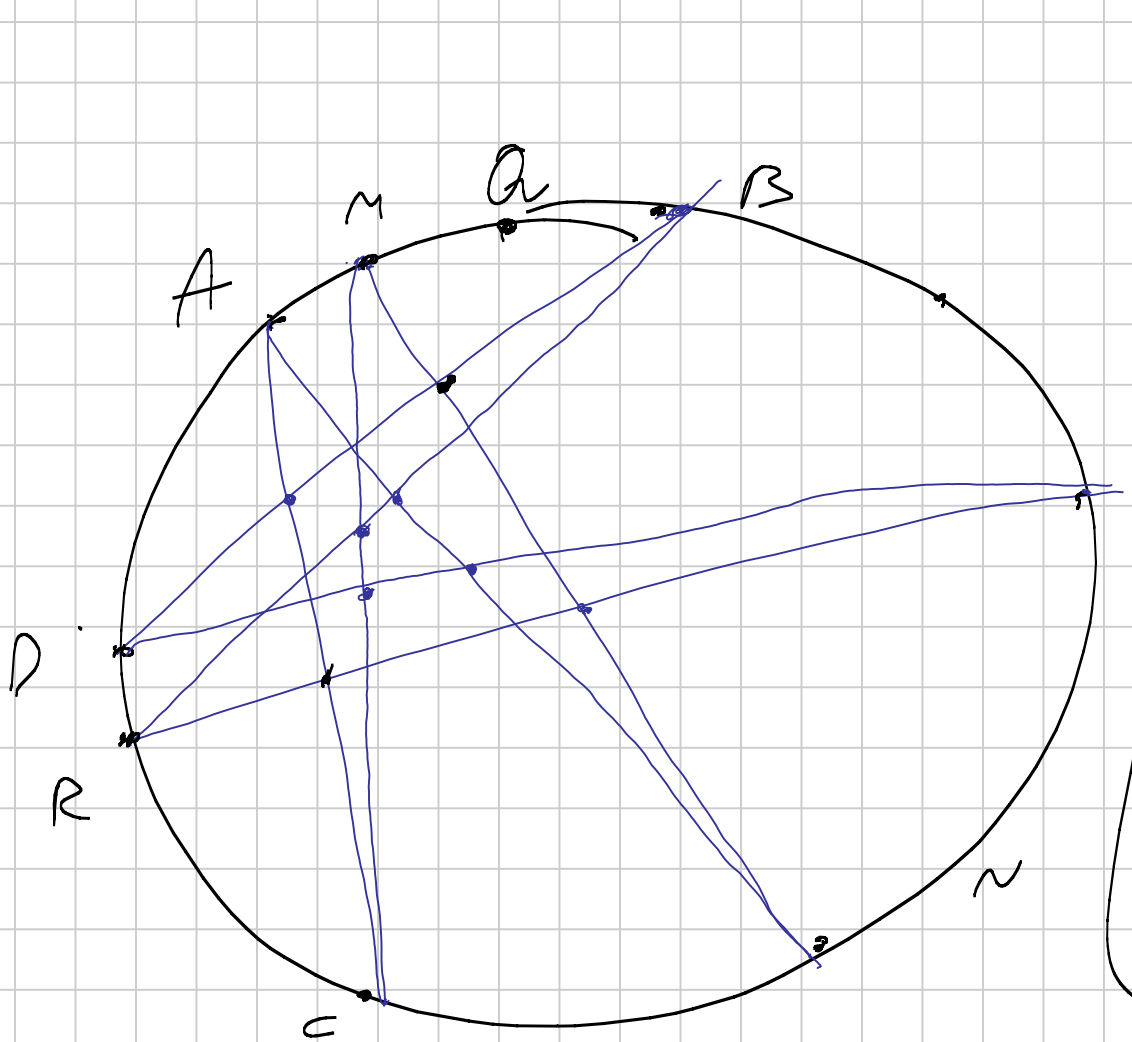
x, y, z, w, o cíclicos

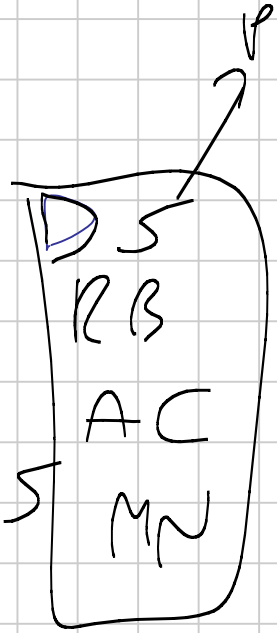
$\Leftrightarrow$

x, y, z, w, p cíclicos

x, y, z, w, o, p concurrentes

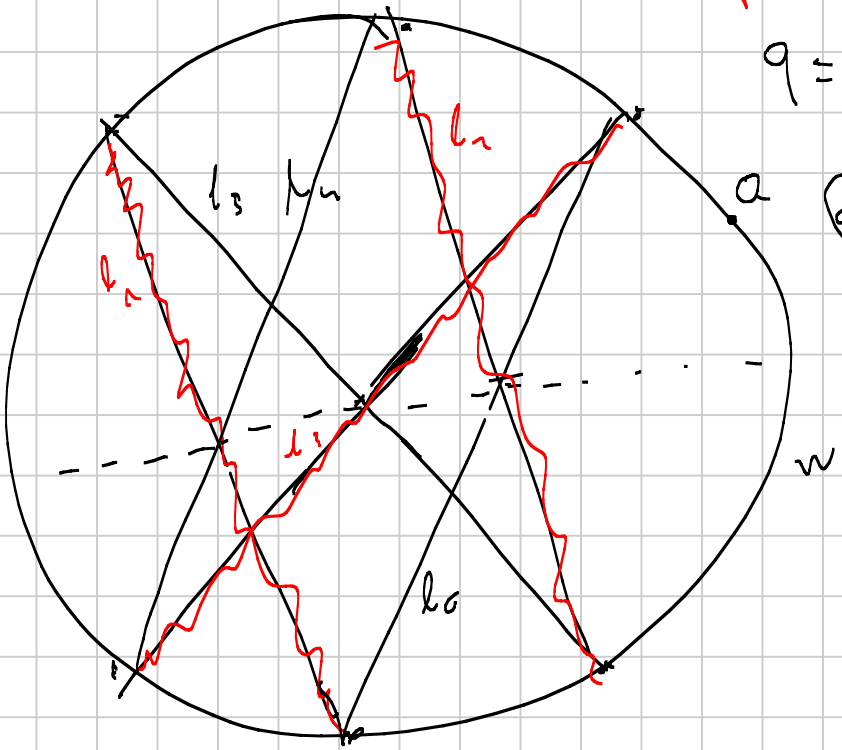






$\alpha p + \beta q = v$

φ |



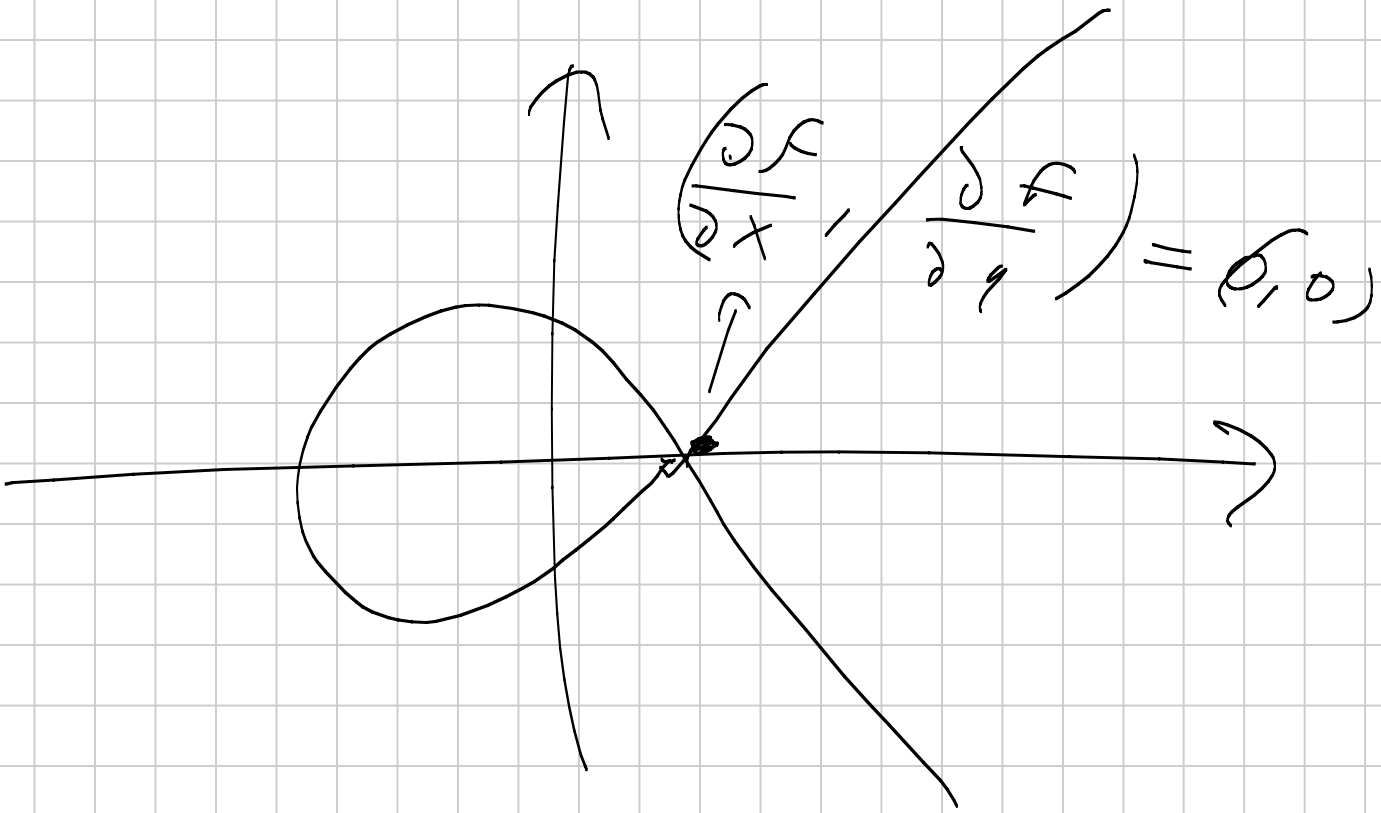
$p = l_1 \cup l_2 \cup l_3$

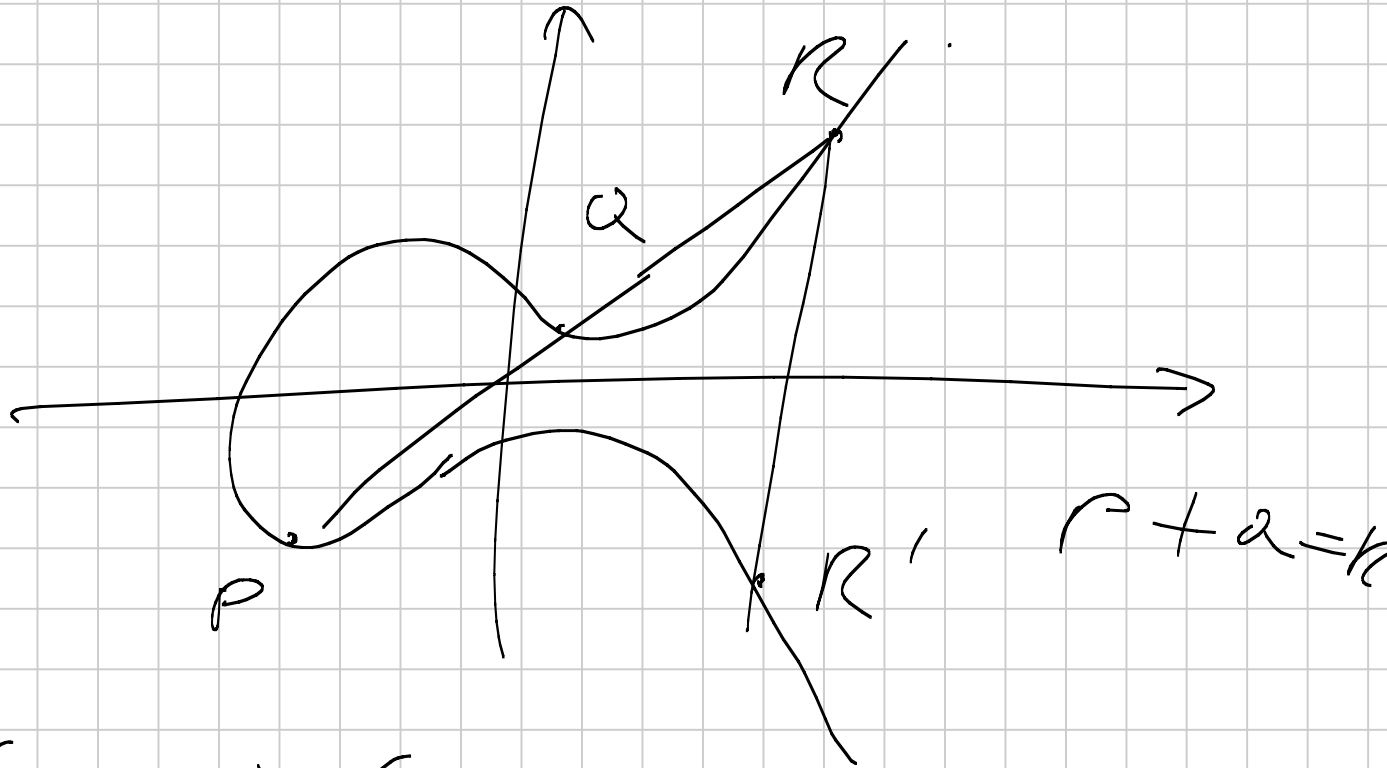
$q = l_4 \cup l_5 \cup l_6$

$\alpha p + \beta q = 1$

$w \mid \alpha p + \beta$

$$y^2 = x^3 + ax + b$$





$$(P+Q)+R = P+(Q+R)$$