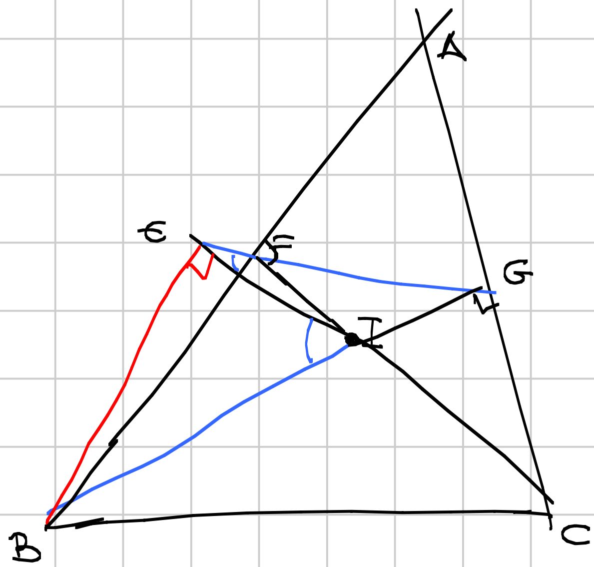
PREIMO 2010 — GM

Titolo nota 20/05/2010

Tesi: E, F, G allineati



$E\hat{F}B + B\hat{F}G = 180$

BIFE è ciclico,

$E\hat{F}B = E\hat{I}B = 90 - EBI$

$EBI = E\hat{B}C - I\hat{B}C$

$= 90 - \frac{\gamma}{2} - \frac{\beta}{2}$

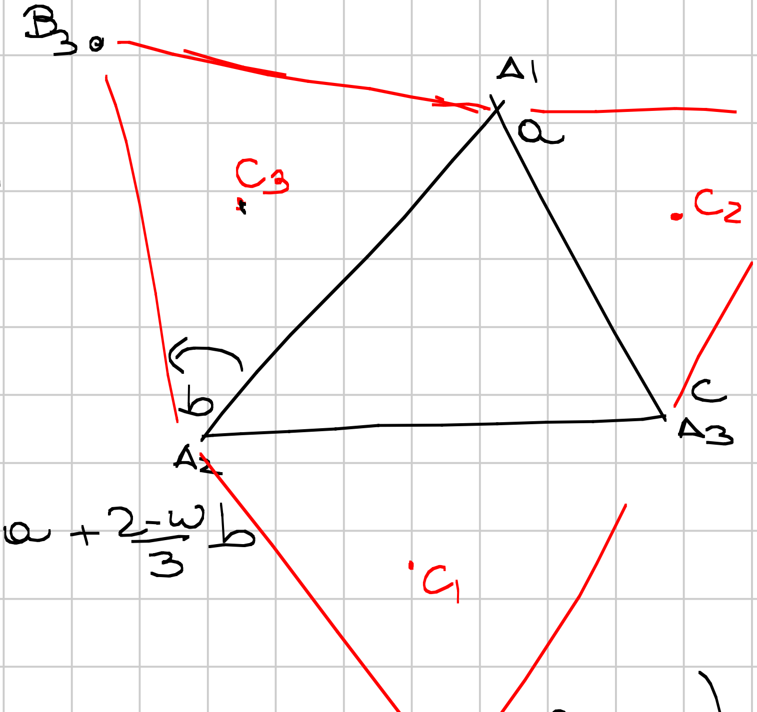
AFG è isoscele

$AFG = 90 - \frac{\alpha}{2}$

$BFG = 90 + \frac{\alpha}{2}$

PROBLEMA 2

Baricentro di $C_1C_2C_3$
$= $ Baricentro di $A_1A_2A_3$



$B_3 \rightsquigarrow b + (a-b)\,\omega$
ω radice sesta di 1.

Bar $A_1A_2B_3$

$$C_3 \rightsquigarrow \frac{a+b+b+(a-b)\omega}{3} = \frac{1+\omega}{3}a + \frac{2-\omega}{3}b$$

Bar $C_1C_2C_3$:

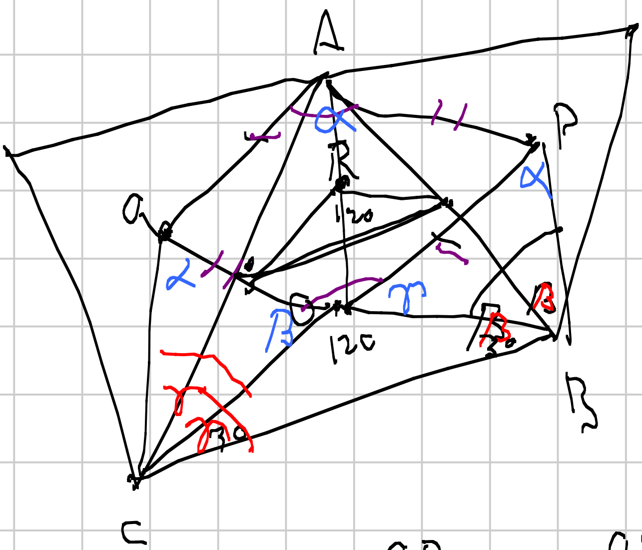
$$\frac{1}{3}\left(\frac{1+\omega}{3}a + \frac{2-\omega}{3}b + \frac{1+\omega}{3}b + \frac{2-\omega}{3}c + \frac{1+\omega}{3}c + \frac{2-\omega}{3}a\right)$$

$$= \frac{1}{3}(a+b+c)$$

—— o —— o

Sol. 2

Lemma 1.



P, Q, R

$AR = RO$

O

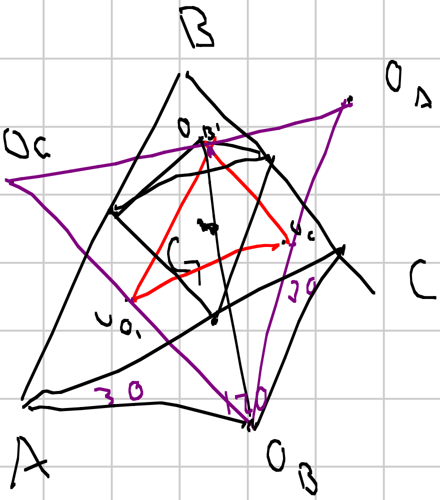
$$\frac{OB}{CB} = \frac{PB}{OB}$$

$\Delta PBO \sim \Delta ABC$
$\Delta QCO \sim \Delta ABC$

$$\frac{OB}{CB}$$

$$\frac{OP}{CA} = \frac{QA}{CA}$$

$OP = QA$



G baricentro
ΔABC

O_C , $O_{B'}$, O_A

G baricentro
di $\Delta O_A O_B O_C$

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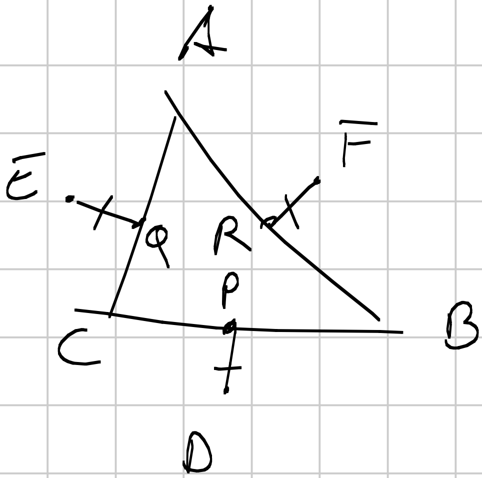
a, b, c equil. $\Rightarrow$ $a+\omega b+\omega^2 c=0$

ω T.c. $1+\omega+\omega^2=0$.



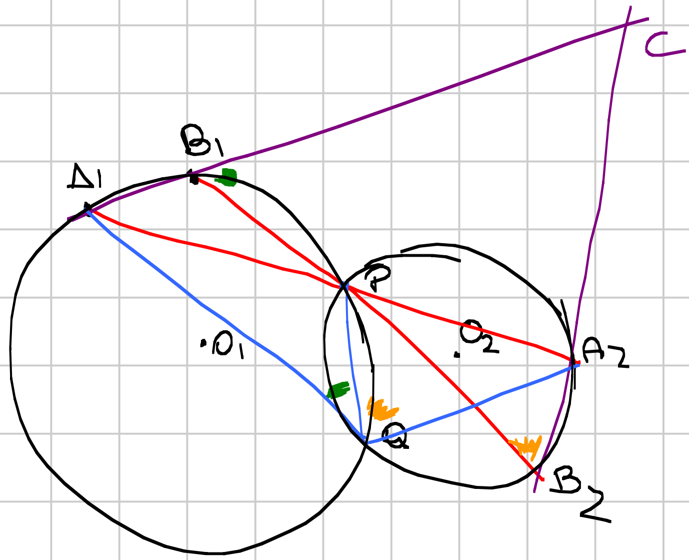
$D=\frac{c+b}{2}+i(c-b)k$

$E=\frac{a+c}{2}+i(a-c)k$

$F=\frac{b+a}{2}+i(b-a)k$

PROBLEMA 3

circoc di A_1A_2C giacciono su una circonferenza.

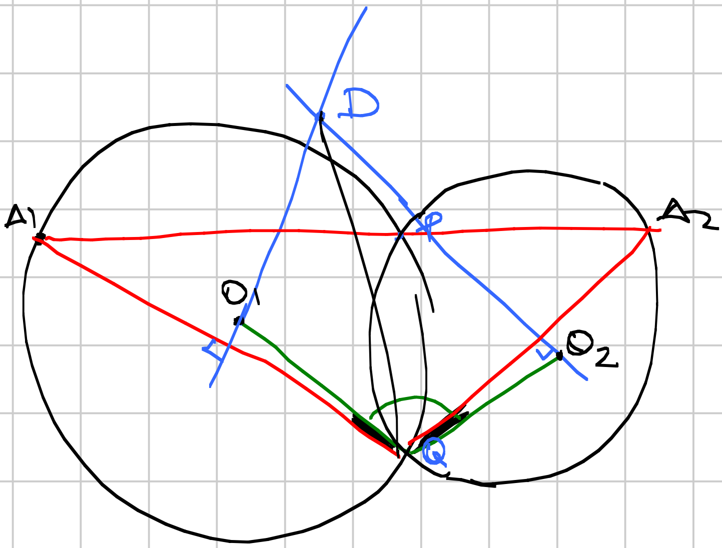


CA_1QA_2 è ciclico

$C = 180 - \ \ -$ (triang B_1B_2C)

$Q = \ \ +$

Tesi: circoc di A_1A_2Q giacciono su una circonferenza.



$O_1\hat{D}O_2$ non dipende da A_1

$O_1\hat{D}O_2 = 180 - A_1\hat{Q}A_2$

$A_1\hat{Q}A_2$ non dip da A_1?

$A_1\hat{Q}A_2 = O_1\hat{Q}O_2$

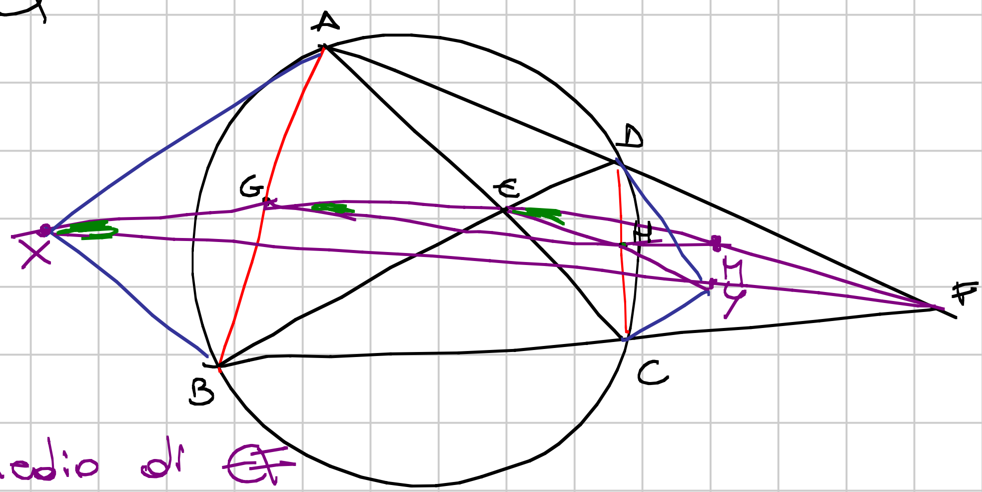
~~Vogliamo dim $O_1\hat{Q}A_1 = O_2\hat{Q}A_2$~~

$A_1\hat{Q}A_2 = 180 - \hat{A}_1 - \hat{A}_2$

Rotoomotetia di centro Q manda A_1 ⇝ centri

PROBLEMA 4

$F\hat{E}H = E\hat{G}H$.

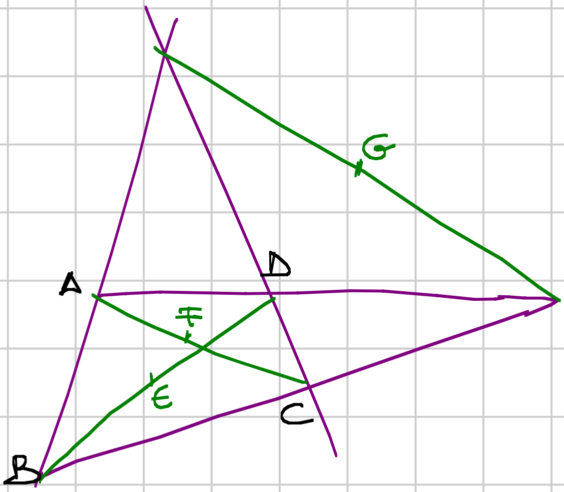


ACBD

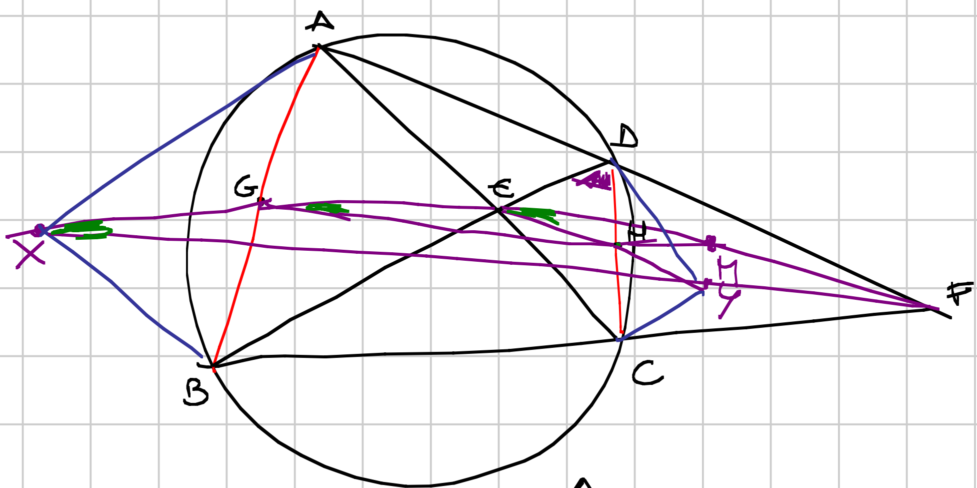
Oss: M è pto medio di EF

$M = GH \cap EF$

Fatto: ABCD quadr



E, F, G allineati .



Simmetria risp alla bis di $A\hat{F}B$ + omotetia di centro F rapporto $\frac{FA}{FC} = \frac{FB}{FD}$.

$C \longrightarrow A$

$D \longrightarrow B$

$H \longrightarrow G$

$E \longrightarrow$? X

$Y \longrightarrow E$

$2EG = EX$ $2EH = EY$ $E\hat{G}H = H\hat{E}F$

$\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad \shortparallel$

$\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad E\hat{X}F$

$GH \parallel XY$

X, Y, F allineati.