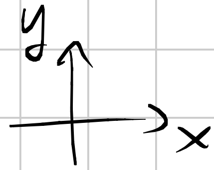
CAMPOBASSO 2012

Titolo nota 24/02/2012

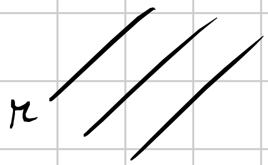
GEOMETRIA

geometria analitica $P(x, y)$



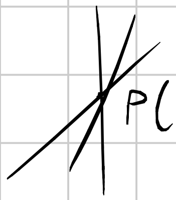
$r: y = mx + q \qquad ax + by + c = 0$

m



$q \qquad x = 0$

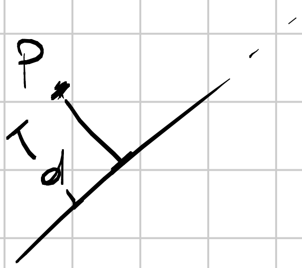
$r \parallel r' \qquad m = m' \qquad m = -\dfrac{1}{m'} \qquad r \perp r'$



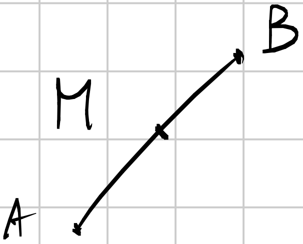
$P(x_p, y_p)$ FASCIO PROPRIO $(y - y_p) = m(x - x_p)$

$A(x_A, y_A)$
$B(x_B, y_B)$

$$\frac{y - y_A}{y_B - y_A} = \frac{x - x_A}{x_B - x_A} \qquad m = \frac{y_B - y_A}{x_B - x_A}$$



$$d = \frac{|a x_p + b y_p + c|}{\sqrt{a^2 + b^2}}$$



$$x_M = \frac{x_A + x_B}{2} \qquad y_M = \frac{y_A + y_B}{2}$$

Sym

$P'(x', y')$

$P(x, y)$

ASSE X	ASSE Y	$O(0,0)$	(x_0, y_0)
$\begin{cases} x' = x \\ y' = -y \end{cases}$	$\begin{cases} x' = -x \\ y' = y \end{cases}$	$\begin{cases} x' = -x \\ y' = -y \end{cases}$	$\begin{cases} x' = 2x_0 - x \\ y' = 2y_0 - y \end{cases}$

circonferenza

$$x^2 + y^2 = r^2$$

$$(x - x_c)^2 + (y - y_c)^2 = r^2$$

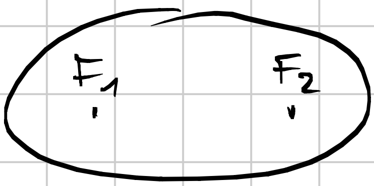
$$x^2 + y^2 + ax + by + c = 0$$

$$C\left(-\frac{a}{2}, -\frac{b}{2}\right)$$

$$r = \frac{1}{2}\sqrt{a^2 + b^2 - 4c}$$

ellisse

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$$



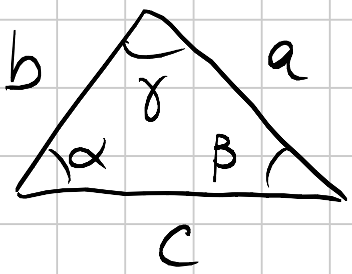
$$PF_1 + PF_2 = 2a$$

$$c^2 = a^2 - b^2$$

$a > b$

$$F_{1,2}(\pm c, 0)$$

TEOREMA DEI SENI

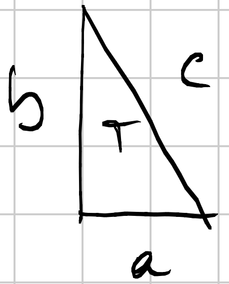


$$\frac{a}{\operatorname{sen}\alpha} = \frac{b}{\operatorname{sen}\beta} = \frac{c}{\operatorname{sen}\gamma} = 2R$$

TEOREMA DI CARNOT
(o del coseno)

$$b^2 = a^2 + c^2 - 2ac\cos\beta$$

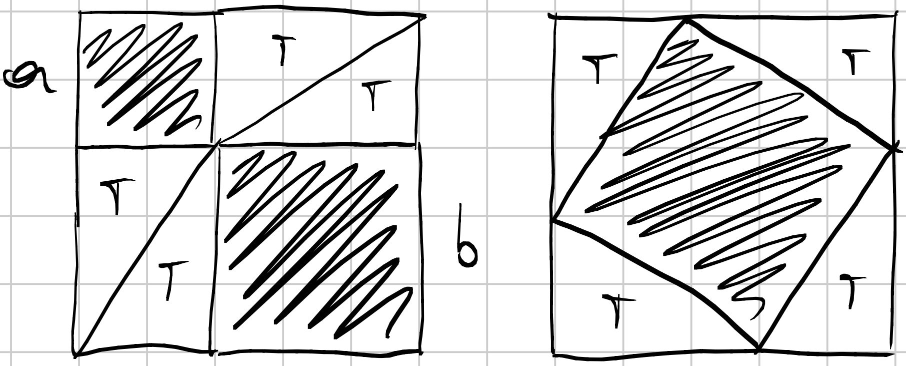
TEO PITAGORA

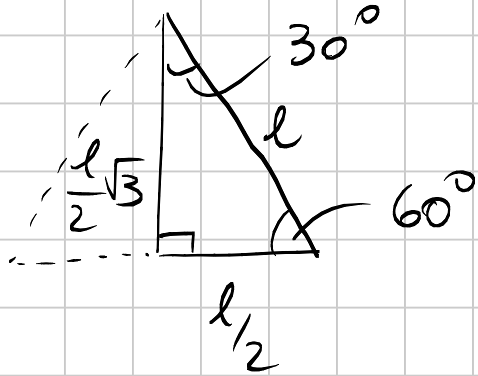


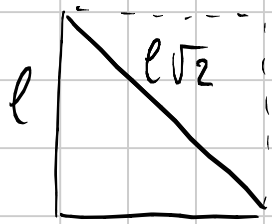
$$a^2 + b^2 = c^2$$

3	4	5
5	12	13
7	24	25
8	15	17

TERNE PITAGORICHE



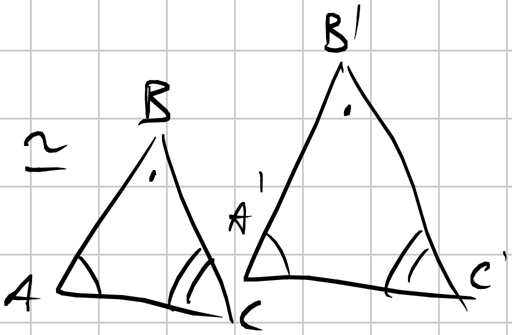




CRITERI DI CONGRUENZA: "≡"

1 - 2 LATI e ANGOLO COMPRESO
2 - 1 LATO e 2 ANGOLI
3 - 3 LATI CONGRUENTI

CRITERI DI SIMILITUDINE: ≃

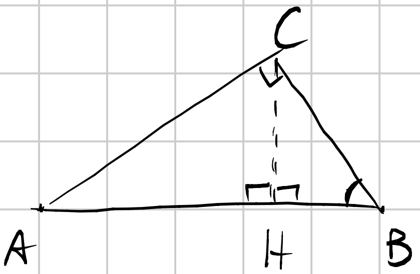


1 - 3 ANGOLI CONGR.
2 - 2 LATI IN PROPORZIONE e ANGOLO COMPRESO
3 - 3 LATI IN "

$$\frac{AB}{A'B'} = \frac{AC}{A'C'} = k$$

$$AB = k\,A'B' \quad \mathcal{A} = k^2 \mathcal{A}'$$

TEOREMI DI EUCLIDE



$\overset{\triangle}{ABC}$

ACH

HBC

$\overset{\triangle}{ABC} \simeq \overset{\triangle}{HBC}$

$ABC \simeq \overset{\triangle}{ACH}$

$HBC \simeq \overset{\triangle}{ACH}$

$\overset{\triangle}{AHC} \simeq \overset{\triangle}{HBC}$

$$\underbrace{\frac{AB}{BC}} = \frac{AC}{HC} = \underbrace{\frac{BC}{HB}}$$

$$BC^2 = AB \cdot HB$$

I TEO EUCLIDE

$$\frac{AH}{CH} = \frac{CH}{HB}$$

$$AH \cdot HB = CH^2$$

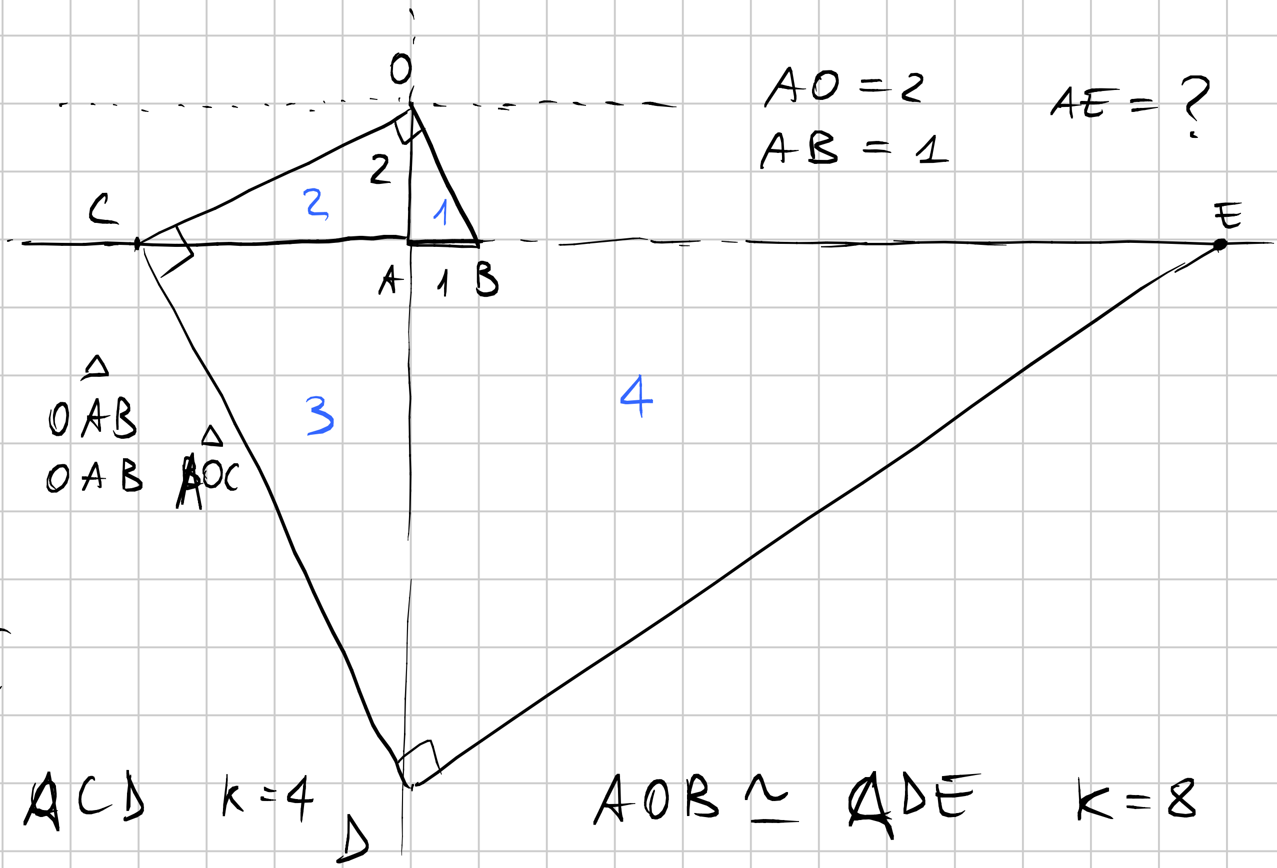
II TEO EUCLIDE

Es

$AO = 2$

$AB = 1$

$AE = ?$



$AB = 1$ $\quad \overset{\triangle}{OAB}$

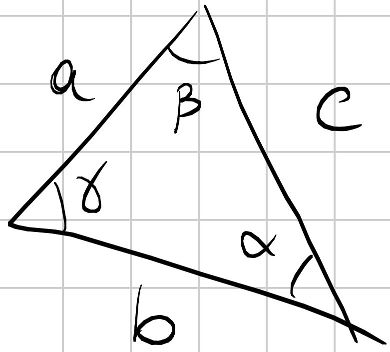
$OA = 2$ $\quad OAB \quad \overset{\triangle}{AOC}$

$$\frac{AB}{OA} = \frac{1}{2}$$

$AOB \simeq ACD \quad k = 4$

$AOB \simeq ADE \quad k = 8$

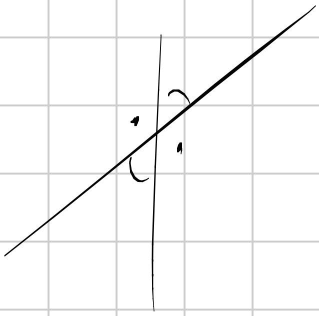
$$\frac{AE}{AO} = 8 \qquad AE = 16$$

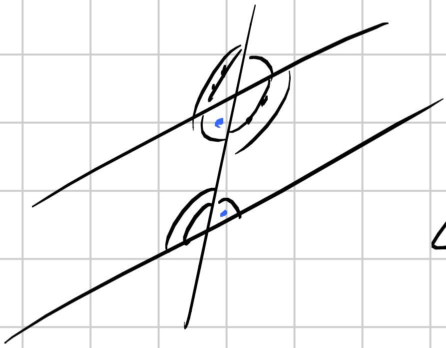


$$\alpha + \beta + \gamma = 180^\circ$$

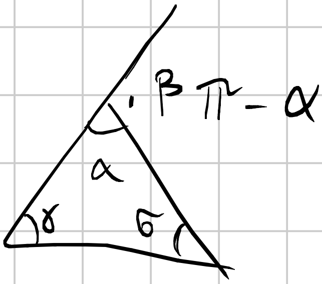
$$a < b + c$$

$$c > |b - a|$$





$$\measuredangle + \measuredangle = 180^\circ$$

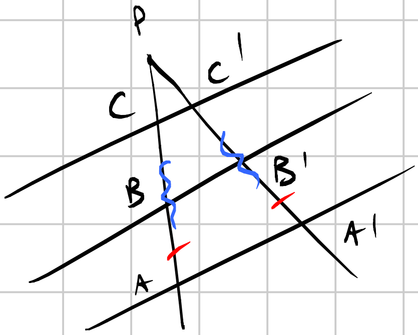


$180^\circ - \alpha$

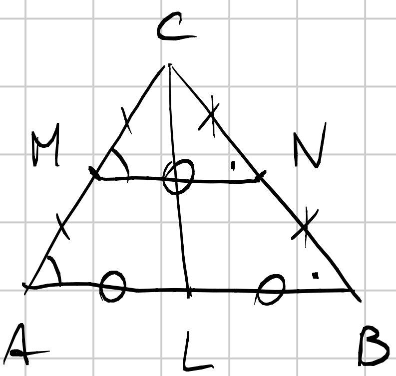
TEO ANG EST.

$\beta > \alpha \qquad \beta > \gamma \qquad \beta > \sigma$

TEO DI TALETE



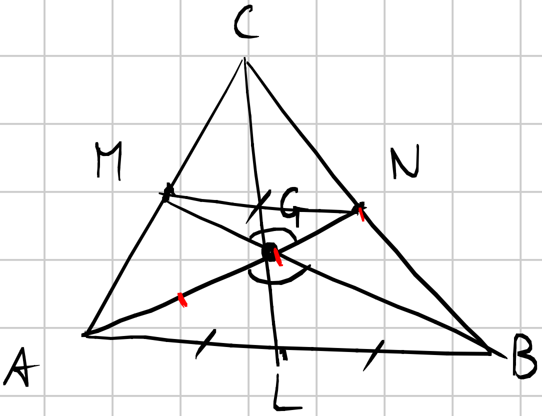
$$\frac{AB}{A'B'} = \frac{AC}{A'C'} = \frac{BC}{B'C'} = \dots\ k$$



M, N pti medi AC, CB

$\overset{\triangle}{ABC} \simeq \overset{\triangle}{CMN}$

$\Rightarrow MN \,//\, AB$



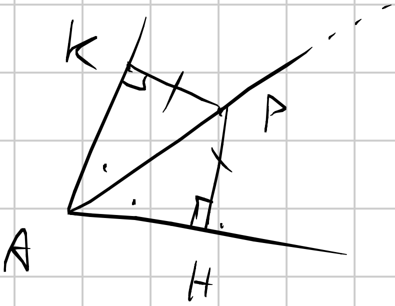
G **BARICENTRO**

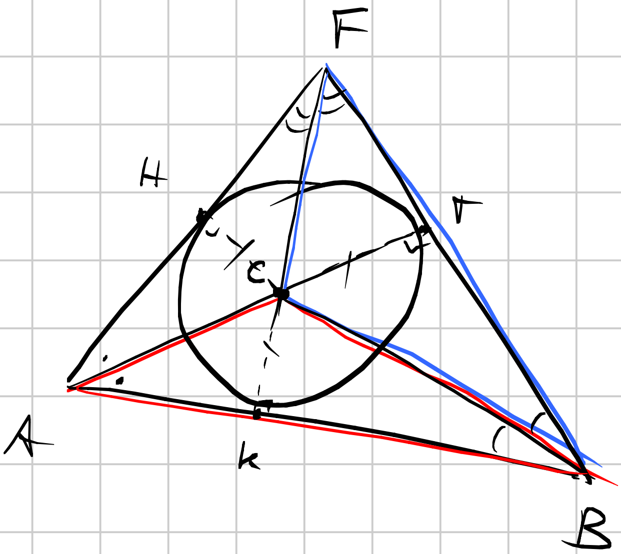
incontro delle mediane

$$\overset{\triangle}{MNG} \simeq \overset{\triangle}{AGB} \Rightarrow 2GN = AG$$

$$2MN = AB$$

BISETTRICE



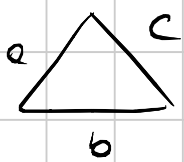


C **INCENTRO** incontro bisettrici

$$\mathcal{A}_{ABF} = \mathcal{A}_{ABC} + \mathcal{A}_{BFC} + \mathcal{A}_{FCA} = \frac{AB\cdot r}{2} + \frac{BF\cdot r}{2} + \frac{FA\cdot r}{2}$$

$$= r/2\,(BF+FA+AB) = \frac{r}{\cancel{2}}\cancel{2}p$$

$$\mathcal{A}_{ABF} = r\cdot p$$

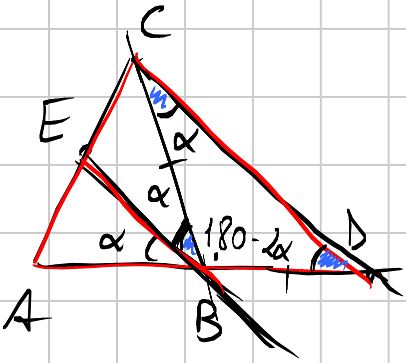


FORMULA DI ERONE

$$\mathcal{A} = \sqrt{p(p-a)\cdot(p-b)(p-c)}$$

teo della bisettrice

$$\frac{AE}{EC} = \frac{AB}{BC}$$



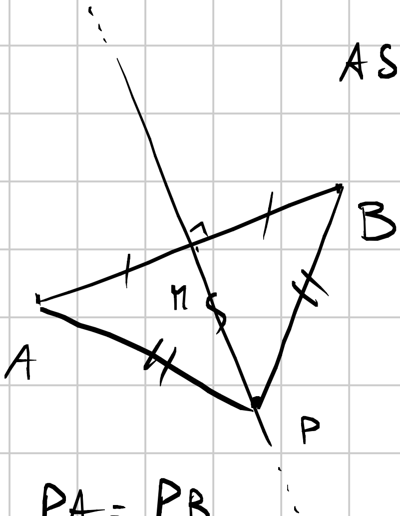
$CD \parallel EB$

$$\frac{AE}{EC} = \frac{AB}{BD}$$ da Talete

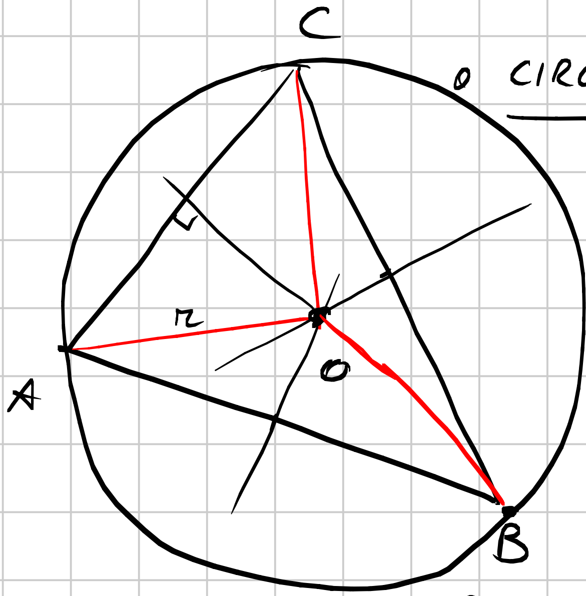
$CB = BD$

$$\frac{AE}{EC} = \frac{AB}{CB}$$

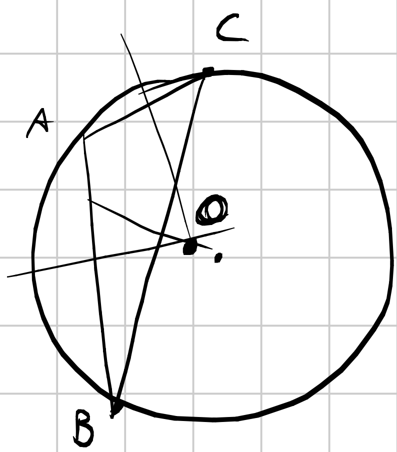
ASSE DI AB

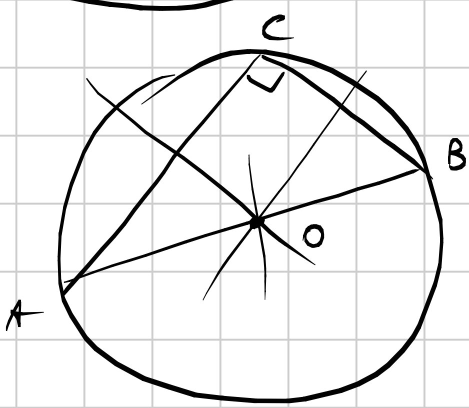


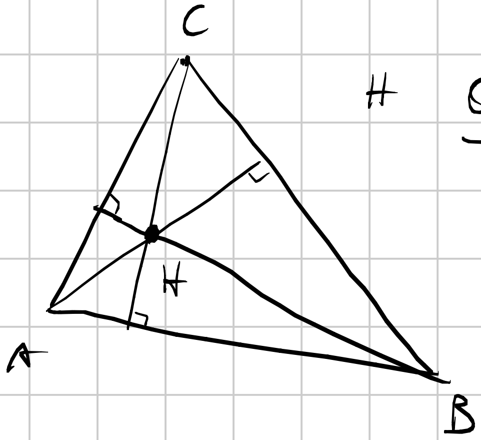
$PA = PB$



O CIRCOCENTRO

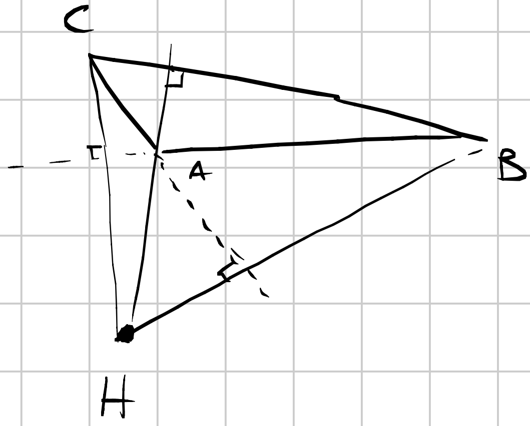






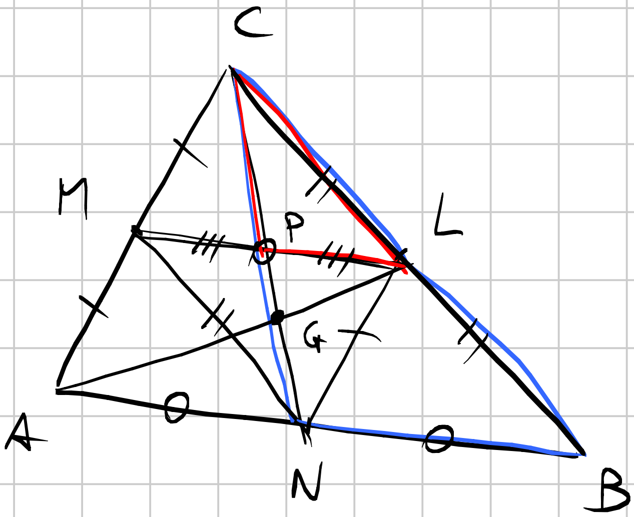
H ORTOCENTRO

altezze



OSS. A, H, B, C (SISTEMA ORTOCENTRICO)

es.



M, L, N pti medi

ⓐ $\triangle LMN \simeq \triangle ABC$

$\triangle MLC \equiv \triangle MNL$

$\triangle MLC \simeq \triangle ABC \quad k = 2$

$\triangle LMN \simeq \triangle ABC$

$ML = \frac{1}{2} AB$

ⓑ $\triangle LMN$ e $\triangle ABC$ hanno lo stesso G baric.

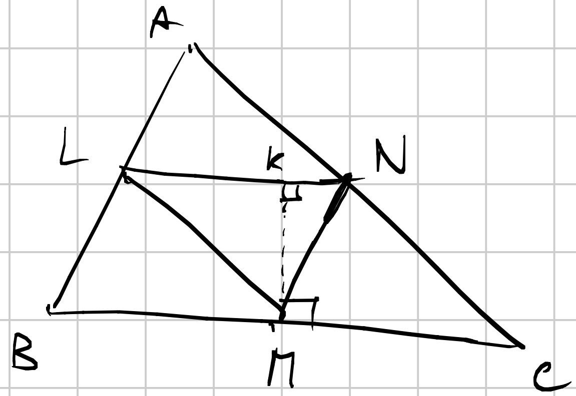
G baricentro di $\triangle ABC$

$\triangle CPL \simeq \triangle CNB$

$\triangle CMP \simeq \triangle CAN \implies MP = PL \implies$ PN è mediana di $\triangle MNL$

$AN = NB$

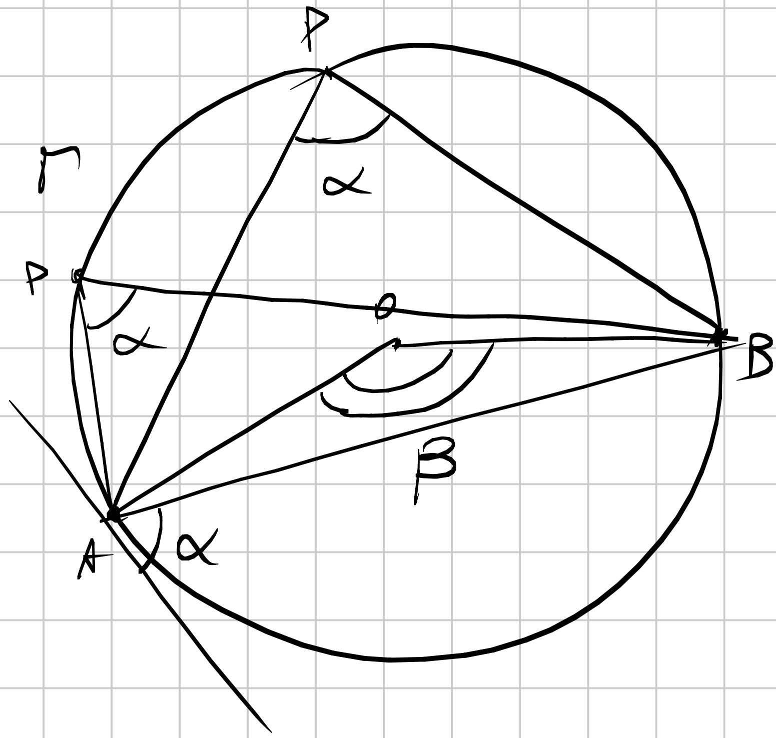
(c) circocentro di $\overset{\triangle}{ABC}$ è
ortocentro di $\overset{\triangle}{LMN}$



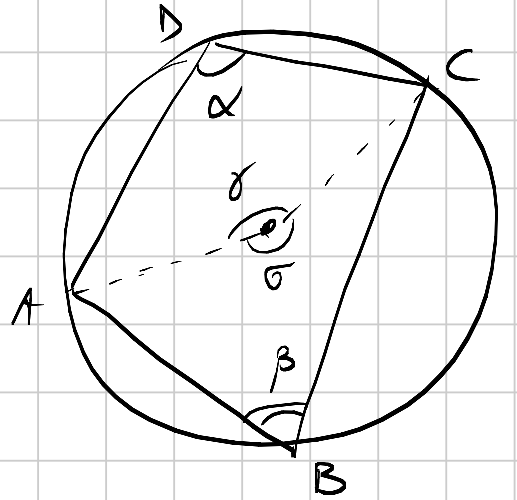
$LN \parallel BC$

$MK \perp BC \Rightarrow MK \perp LN$

CIRCONFERENZE



ABCD è CICLICO $\Longleftrightarrow \hat{D} + \hat{B} = \hat{A} + \hat{C} = 180^\circ$



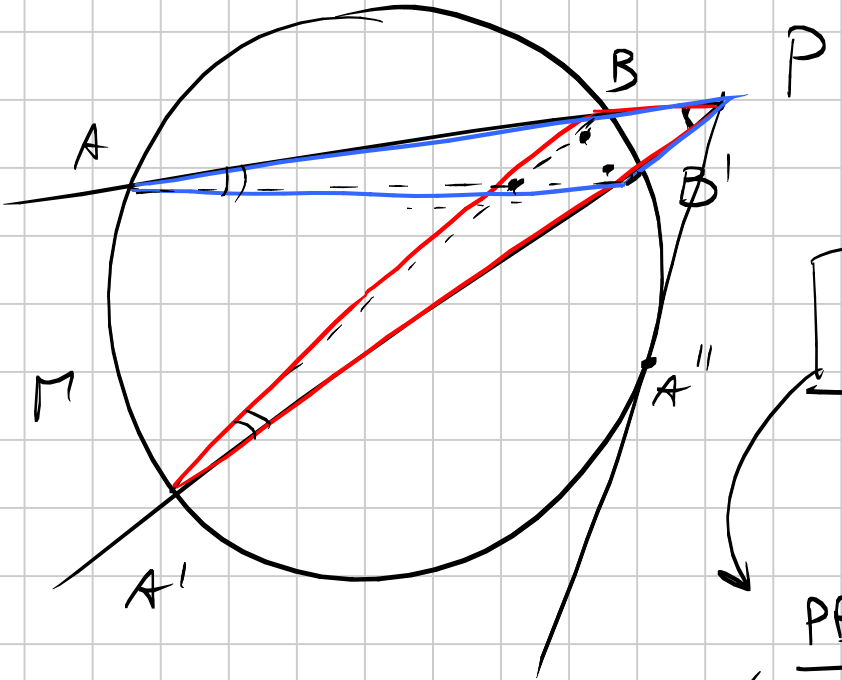
$\alpha = \frac{1}{2}\sigma$

$\beta = \frac{1}{2}\gamma$

$\gamma + \sigma = 360^\circ$

$2\beta + 2\alpha = 360^\circ \Rightarrow \alpha + \beta = 180^\circ$

POTENZA DI UN PUNTO P RISP Γ



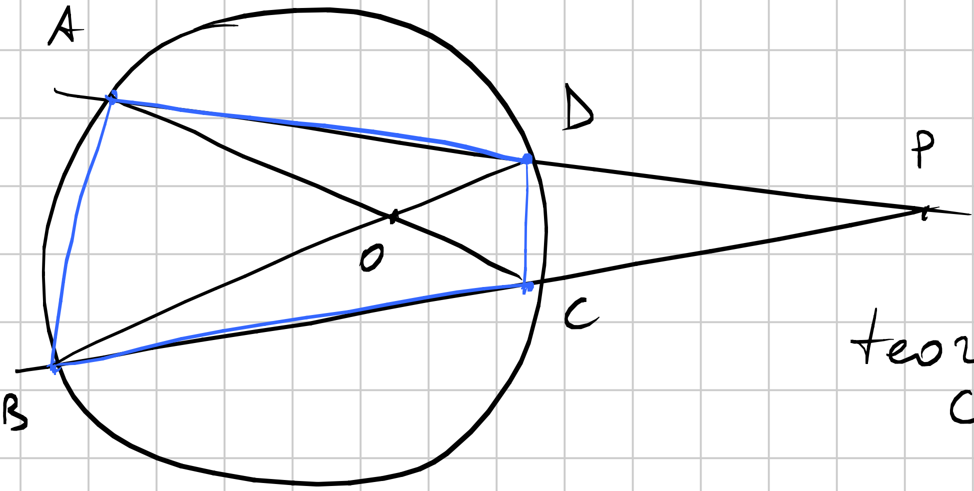
$$Pow_\Gamma(P) = PA \cdot PB$$

$$\boxed{PA \cdot PB = PA' \cdot PB'}$$

$$(PA'')^2 = PA \cdot PB$$

$$\frac{PB}{PA'} = \frac{PA}{PB'}$$

$$\overset{\triangle}{PBA'} \simeq \overset{\triangle}{B'PA}$$



$$BO \cdot OD =$$
$$= AO \cdot OC$$

teorema delle corde

teo delle secanti $AP \cdot PD = BP \cdot PC$