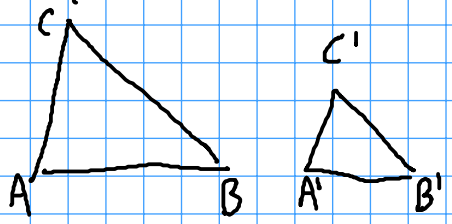
GEOMETRIA

Fabio

[Orari: 9 - 12
14.15 - 17.15]

Criteri di similitudine



$C\hat{A}B = C'\hat{A}'B'$
$A\hat{C}B = A'\hat{C}'B'$
$A\hat{B}C = A'\hat{B}'C'$

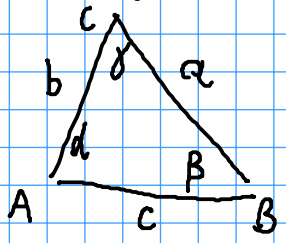
$AC : A'C' = AB : A'B' = BC : B'C'$

I) 2 angoli congruenti

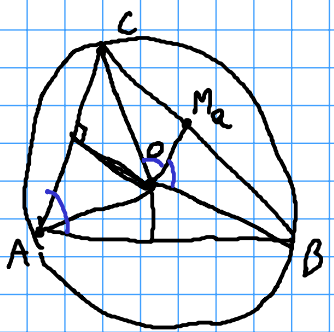
II) $B\hat{A}C = B'\hat{A}'C'$ e $\frac{AC}{A'C'} = \frac{AB}{A'B'}$

III) $\frac{AC}{A'C'} = \frac{AB}{A'B'} = \frac{BC}{B'C'}$

Punti notevoli dei triangoli



CIRCOCENTRO (assi)



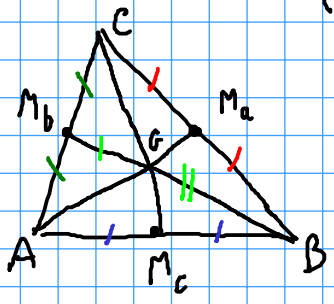
$OA = OB = OC = R$

$C\hat{O}M_a = \alpha$

$O\hat{C}B = 90 - \alpha$

$O\hat{C}A = 90 - \beta$

BARICENTRO (mediane)

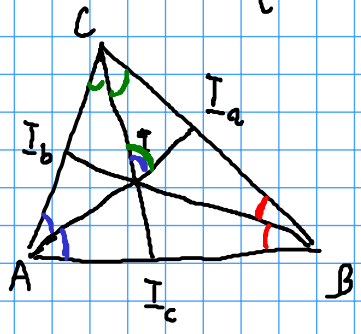


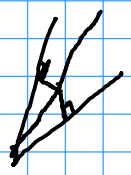
$BG = 2GM_b$

$AG = 2GM_a$

$GC = 2GM_c$

INCENTRO (bisettrici)





$\gamma = \alpha/2$

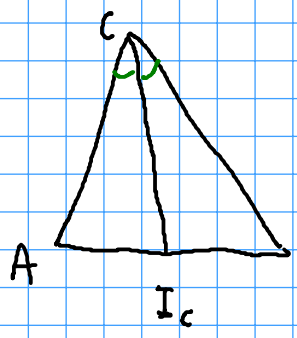
$\gamma = \beta/2$

$\gamma = \gamma/2$

$\hat{AI_aC} = 180 - \gamma - \frac{\alpha}{2} = \beta + \frac{\alpha}{2}$

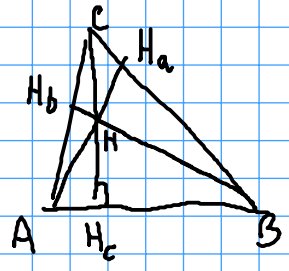
$\hat{I_aIC} = 180 - \frac{\gamma}{2} - \beta - \frac{\alpha}{2} = \frac{\alpha + \gamma}{2}$

Teorema delle bisettrici



$$\frac{AI_c}{BI_c} = \frac{AC}{BC}$$

ORTOCENTRO (altezze)

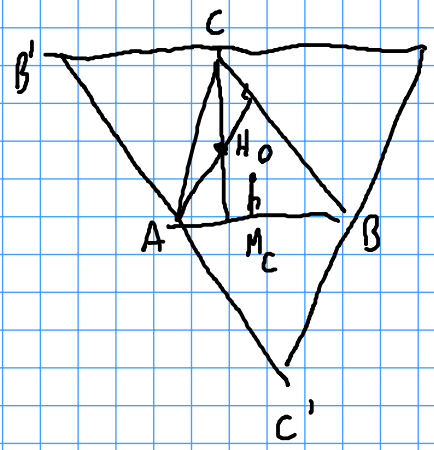


$\hat{ACH_c} = 90 - \alpha = \hat{ABH_b}$

$\hat{CHH_b} = \alpha$

$\hat{CHH_a} = \beta$

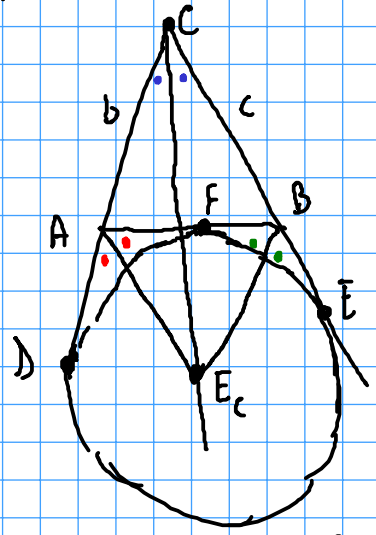
$\hat{BHH_a} = \gamma$



$CH = 2OM_c$

H è circocentro di $A'B'C'$

EXCENTRI



$CD = CE$

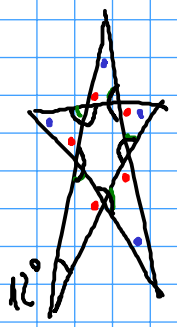
$AF = AD$

$BF = BE$

$2CD = CD + CE = b + AD + c + BE =$

$= b + c + AF + BF = a + b + c$

Esercizio



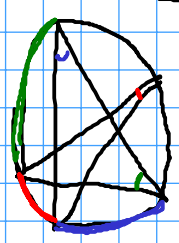
$\boxed{5 \cdot 180 + 3 \cdot 180}$

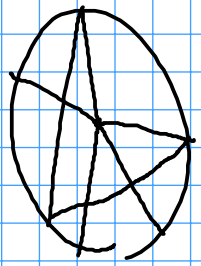
$x = \bullet$

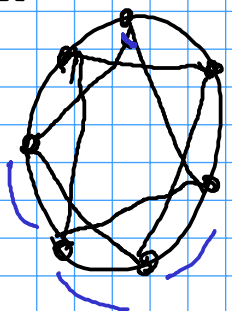
$$\begin{cases} 12 + 4\bullet + 2x = 5 \cdot 180 \\ 12 + 4\bullet + x = 3 \cdot 180 \end{cases}$$

$x = 2 \cdot 180$

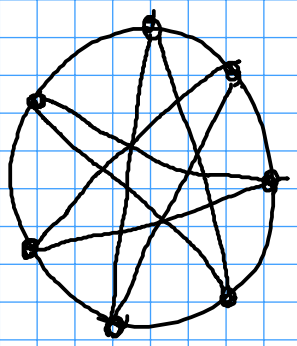
$12 + 4\bullet = 180$



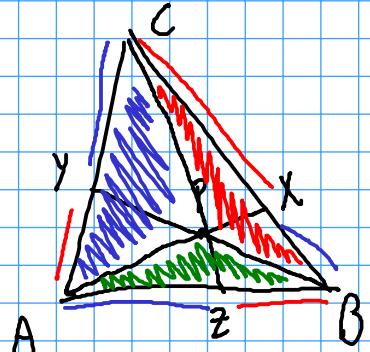




$3 \cdot 180$



TEOREMA DI CEVA



$$\frac{AZ \cdot BX \cdot CY}{BZ \cdot CX \cdot AY} = 1$$

$[DEF]$ = area di DEF

Dim: $\frac{AZ}{BZ} = \frac{[ZAC]}{[ZBC]} = \frac{[PAZ]}{[PBZ]} = \frac{[ZAC]-[PAZ]}{[ZBC]-[PBZ]} = \frac{[CPA]}{[CPB]}$

$\frac{a}{b} = \frac{c}{d} \leftarrow \frac{a}{b} = \frac{a-c}{b-d}$

$\frac{AZ}{BZ} = \frac{\quad}{\quad}$ $\quad \frac{BX}{CX} = \frac{\quad}{\quad}$ $\quad \frac{CY}{AY} = \frac{\quad}{\quad}$

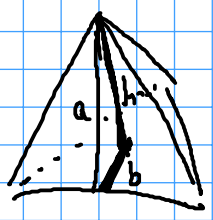
□

Esercizi:

1. 10 biglie di raggio 1 cm

Quanto è alta la piramide?

Tetraedro di lato 2



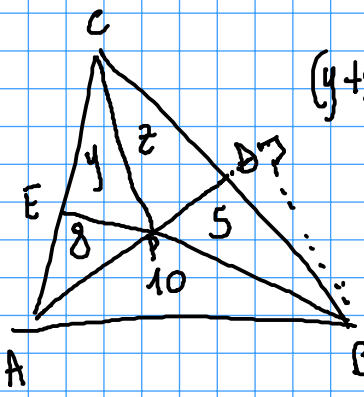
$a = 2 \cdot \frac{\sqrt{3}}{2} = \sqrt{3}$

$b = \frac{\sqrt{3}}{3}$ $\quad h = \sqrt{3 - \frac{3}{9}} = \frac{1}{3} 2\sqrt{6} = \frac{2\sqrt{6}}{3}$

$2 + 2\frac{2\sqrt{6}}{3}$

Esercizi.

1.



$(y+8) : z = AP : PD = 10 : 5$

$y + 8 = 2z \Rightarrow y = 2z - 8$

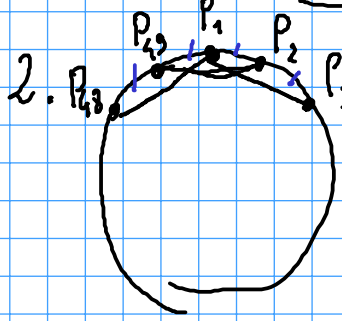
$(z+5) : y = PB : PE = 10 : 8 = 5/4$

$5y = 4z + 20$

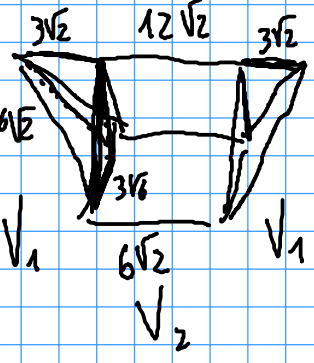
$10z - 40 = 4z + 20 \Rightarrow z = 10$

$y = 12$

$x = 22$

2. 

$45 \cdot 180 = 8100$

3. 

Volume ? $V_2 + 2V_1$

$3\sqrt{6}$

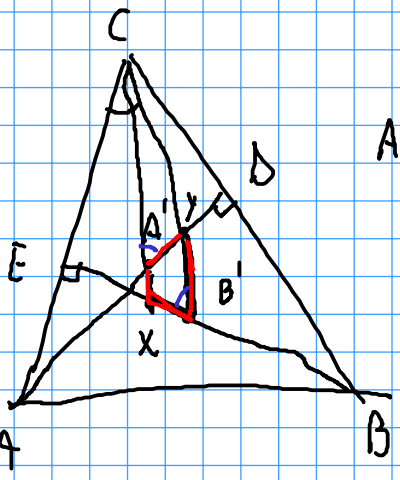
$3\sqrt{2}\sqrt{3-1} = 6$

$Bază = \frac{6\sqrt{2} \cdot 6}{2} = 18\sqrt{2}$

$V_2 = 18\sqrt{2} \cdot 6\sqrt{2} = 216$ $\quad V_2 + 2V_1 = 216 + 72 = 288.$

$V_1 = \frac{18\sqrt{2} \cdot 8\sqrt{2}}{3} = 36$

4.



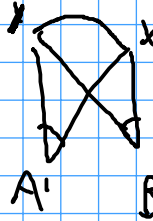
$A'XB'y$ ciclic

$ADC \sim BEC$

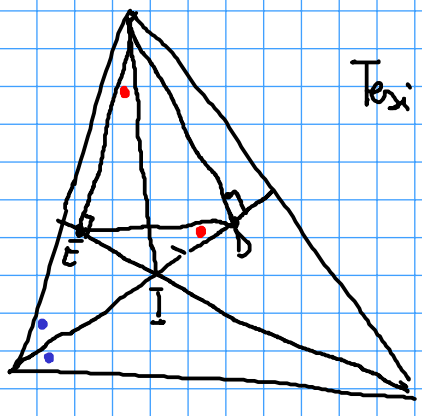
$\frac{CD}{CE} = \frac{AD}{BE} = \frac{\frac{1}{2}A'D}{\frac{1}{2}B'E}$

$CA'D \sim B'EC$

$\hat{CA'D} = \hat{CB'E}$



5.



Tesi $\hat{EDB} = \beta/2$

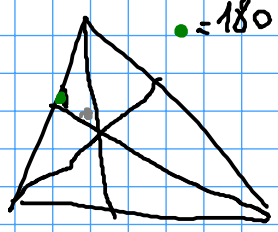
$AEID$ ciclic

$\hat{EAI} = \hat{EDB}$

$\hat{EAI} = 90 - \hat{EIA} = \beta/2$

$\hat{EIA} = 180 - \frac{\alpha}{2} - \left(180 - \alpha - \frac{\gamma}{2}\right) = \frac{\alpha + \gamma}{2}$

C



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