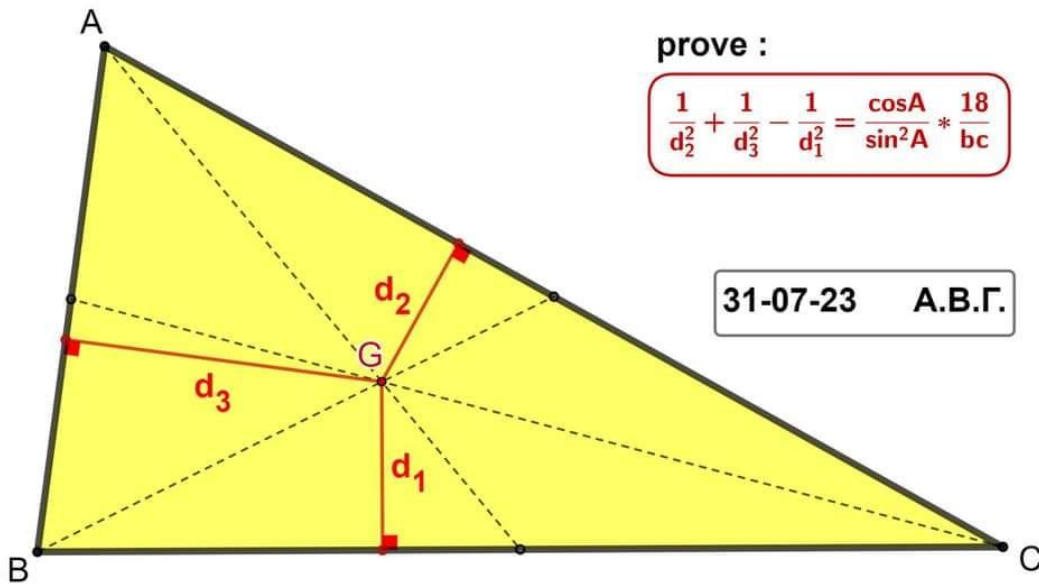


G-centroid

prove :

$$\frac{1}{d_2^2} + \frac{1}{d_3^2} - \frac{1}{d_1^2} = \frac{\cos A}{\sin^2 A} * \frac{18}{bc}$$

31-07-23 A.B.Γ.



Proposed by Thanasis Gakopoulos-Greece

Solution by Daniel Sitaru-Romania

$$\begin{aligned} \frac{1}{d_2^2} + \frac{1}{d_3^2} - \frac{1}{d_1^2} &= \frac{1}{\frac{4F^2}{9b^2}} + \frac{1}{\frac{4F^2}{9c^2}} - \frac{1}{\frac{4F^2}{9a^2}} = \frac{9(b^2 + c^2 - a^2)}{4F^2} = \\ &= \frac{9(a^2 + 2bccosA - a^2)}{4F^2} = \frac{9bccosA}{2F^2} = \frac{9bccosA}{2 \cdot \frac{1}{4}(bc\sin A)^2} = \\ &= \frac{18bccosA}{(bc\sin A)^2} = \frac{18cosA}{bc\sin^2 A} \end{aligned}$$