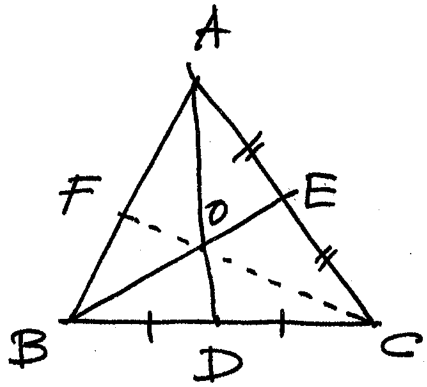
* Geometry problem :- Prove that the 3 medians of a Δ intersect at one point.



In other words; let AD & BE be 2 medians intersecting at O. Then prove that the line COF is also a median.

<u>Note</u> :- The median has the property that it splits a triangle into two equal areas. Why? Because it splits a base into 2 equal halves.

$\therefore$ we need to prove that ΔCAF & ΔCBF have the same area.

Observe that $\Delta ABD = \Delta ADC$ in area (henceforth in this pr $\Delta x = \Delta y$ will imply equal areas)

since $BD = DC$

Also, $\Delta OBD = \Delta OCD$

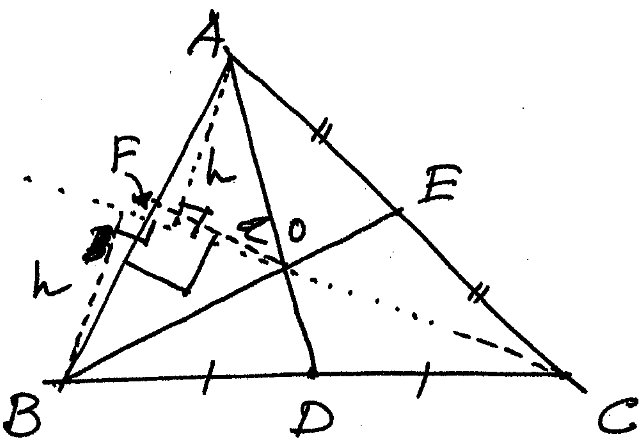
Since $\Delta ABD = \Delta AOB + \Delta OBD$

& $\Delta ADC = \Delta AOC + \Delta OCD$

$\therefore \Delta AOB = \Delta AOC$

Similarly, using the fact that $AE = EC$, we can prove that $\Delta AOB = \Delta BOC$ $\therefore \Delta AOB = \Delta AOC = \Delta BOC$.

Now, note that ΔAOC & ΔBOC share the same base OC. Since $\Delta AOC = \Delta BOC$ $\therefore$ they must have the same height h.



Next, consider the ΔAOB, here ΔAOF & ΔBOF share the same base OF have the same height h.

$\therefore$ $\Delta AOF = \Delta BOF$.

Now, consider the same two Δ's and consider AF & BF as the respective bases. Since $\Delta AOF = \Delta BOF$ & they have the same height d (perpendicular from O to AB),

$$\therefore \quad \Delta AOF = \frac{1}{2} d\, AF = \Delta BOF = \frac{1}{2} d\, BF$$

$\therefore$ $AF = BF$

$\therefore$ CF is also a median.

$\therefore$ proved