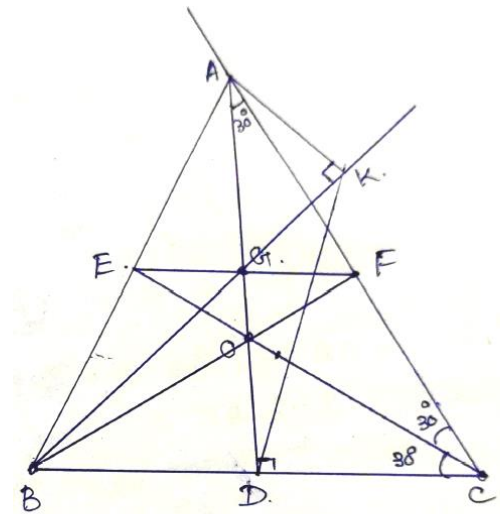
I Prize Winner Mrs. Madhumitha's Solution

Given :



$\angle ACB = 60°$, CE is angle bisector.

$\therefore \angle ECB = \angle ECA = 30°$

$\therefore In\ \Delta\ ADC, \angle DAC = 30°$

$\Longrightarrow OC = OA$

In $\Delta\ ODC,\ \angle DOC = 60°, \angle ODC = 90°$

$\Longrightarrow OD = \frac{1}{2} \quad OC \Longrightarrow \quad OD = \frac{1}{2} \quad OA \Longrightarrow \frac{OA}{OD} = 2$

By theorem (1), [Concurrency Theorem (available in the author's book "The Geometry of Concurrency" page no : 9) & the Rider No: 13 (available at page no : 32 of the same book available in this website)], G is the midpoint of AD. [She has reproduced the proof for both the theorem and result from the Author's book]

$\angle BDA = \angle BKA = 90° \quad \Longrightarrow BDKA$ is concyclic.

As $\angle BDA = 90° \quad \Longrightarrow AB$ is the diameter and G is midpoint of AD.

then by theorem (2) [as per the result vide Rider -3 available in page no:51 of the Author's book "The Novelties of Geometry" available in this site],

$BK^2 = BD^2 + DK^2 + 2AK^2$ ---------------- Proved.