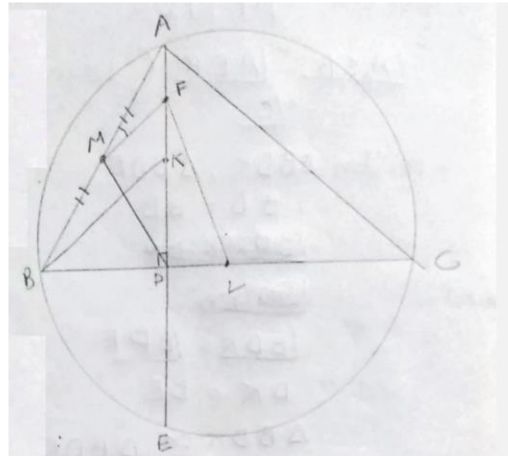
Third Prize Winner Mr.Peeyush Ranjan Pande's Solution



Given:

BM=MA
AE$\perp CB$
BL=LC
DF=$\frac{1}{2}AE$

To Prove:
$\angle MFL = \angle B$

Construction:
Join MD, MF, FL & BE

Proof:

As DF =$\frac{1}{2}AE$
$\Longrightarrow$ AF+DE=AE-FD=$\frac{1}{2}AE$
$\therefore$ AF+ED = FD
Let K on FD such that
AF=FK & KD=DE
Join BK and ML
ΔABD right triangle
DM is the median
DM=BM=AM
$\Longrightarrow \angle MDB = \angle B$
M is midpoint of AB
F is midpoint of AK
$\therefore$ By midpoint theorem
MF$\|$BK
$\angle ACB = \angle AEB$ (same chord)
$= \angle C$
In ΔBDK, ΔBDE
BD=BD
$\angle BDK = \angle BDE$
DK=DE
$\therefore \Delta BDK \cong \Delta BDE$
$\angle BKE = \angle BED = \angle C$
BK $\| MF$
$\angle BKE = \angle MFE = \angle C$
$\angle BAD = 90^0 - \angle B$
$\therefore \angle AMF = \angle C - (90^0 - \angle B)$

$=\angle C + \angle B - 90^0$
$= \angle A + \angle B + \angle C - 90^0 - \angle A$
$=180^0 - 90^0 = \angle A$
$=90^0 - \angle A$
M is midpoint of AB, L is midpoint of BC
$\therefore$ By MPT, ML $\| AC$
$\angle LMB = \angle CAB = \angle A$
$\angle FML = 180^0 - \angle A - (90 - A)$
$=90^0$
$=\angle FDL$
FMDL is cyclic quadrilateral
$\therefore \angle MDB = \angle MFL$
(Exterior $\angle$ = interior angle)
$\angle MDB = \angle MBD = \angle B$
$\therefore \angle B = \angle MFL$