**THIRD PRIZE WINNER OF JUNE MONTH CASH AWARD RIDER MRS.MADHUMITHA’S SOLUTION**

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**Given O is a point outside the circle, OSR, OQP, ODC, OBA are secant to the given circle also given** $∠COA=∠POR=θ$ **(let) given K, L, M,N are mid points of AB, CD, PQ, RS respectively.**

**Construction:**

**Let x be centre of circle such that if drop perpendicular from x to AB, CD, PG, RS. It passes through K, L, M, N respectively.**

**Join XM, XN, XL, XK & LN.**

$∴$$∠XNO=∠XMO=90°$

$⇒XMNO $**forms cyclic quadrilateral**

$⇒$ **X, M,N,O lies on a circle say C1 whose diameter is XO (**$∵∠XMC=∠XNO=90°$**) --- (A)**

**Similarly,** $∠XLO=∠XKO=90°$

$⇒$***XLKO* forms cyclic quadrilateral**

$⇒X,L,K,O$ **lies on circle say C2 whose diameter is XO --------------- (B)**

**Its' clear that we can draw only one circle through X&O having XO as diameter**

$∴$ **C1= C2 (both circle are same)**

$⇒$ **M,N,O,K,L,X lies on same circle C1=C2=C (let)**

$∠MON=∠MLN=θ$ **(angle subtended by arc MN on circumference)**

**And** $∠LOK=∠LNK= θ$ **(angle subtended by arc LK on circumference)**

$⇒ ∠$ **MON =** $∠MLN= ∠LNK= ∠LOK=θ$

 **alternate angles**

**Alternate angles are equal. LN is transversal**

$⇒$**ML**$∥$**NK ---- Hence Proved.**