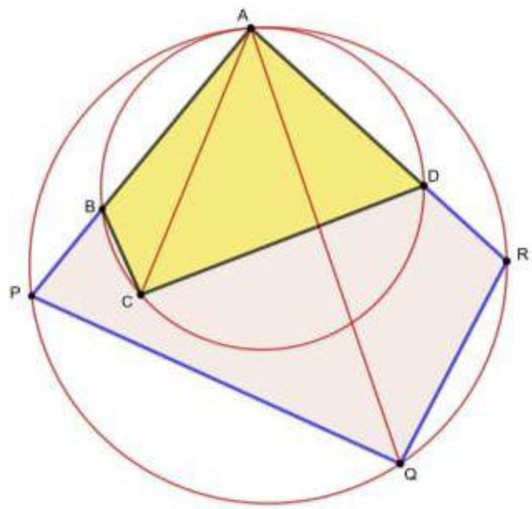
# ROMANIAN MATHEMATICAL MAGAZINE




$$AB = AD, AP = AR \qquad Prove: \frac{[ABCD]}{[APQR]} = \frac{AC^2}{AQ^2}$$

***Proposed by Thanasis Gakopoulos-Greece***

***Solution by Mirsadix Muzefferov-Azerbaijan***

$$\textit{For the angles of quadrilateral ABCD in circle } \omega_1$$

$$< C + < A = \pi \ (1)$$

$$\textit{Also in the APQR quadrilateral}$$

$$< Q + < A = \pi \ (2)$$

$$\textit{Then from } (1) \textit{ and } (2) \Rightarrow < C = < Q$$

$$AB = AD \Rightarrow \cup AB = \cup AD \Rightarrow < ACB = < ACD \Rightarrow AC \textit{ is bisector}$$

$$AP = AR \Rightarrow \cup AP = \cup AR \Rightarrow < AQP = < AQR \Rightarrow AQ \textit{ is bisector}$$

$$\textit{Therefore, according to Thanasis Gakopoulos theorem we get that}$$

$$[ABCD] = \frac{sinC}{2} AC^2; [APQR] = \frac{\sin Q}{2} AQ^2 \Rightarrow \frac{[ABCD]}{[APQR]} = \frac{AC^2}{AQ^2} \ (proved)$$