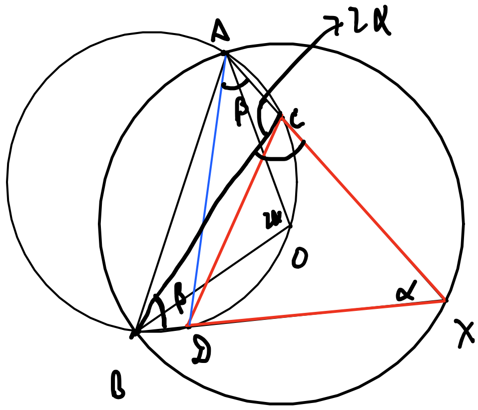
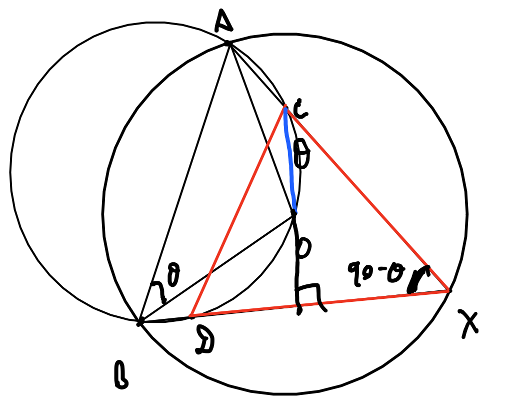
Enoch Yu

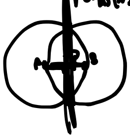
Three distinct points A, B, X lies on a circle with center O where A, B, O are not collinear. Given Ω as the circumcircle of $\triangle ABO$, segments AX and BX intersects with Ω at $C(\neq A)$ and $D(\neq B)$ respectively. Show that O is the orthocenter of $\triangle CXD$.





$\square$

If $AD = DX$ and $BC = CX$,
then, O is the orthocenter
of $\triangle CXD$



$Pow_\omega(A) = Pow_\omega(B)$

$\sqrt{PA^2-r^2} = \sqrt{PB^2-r^2}$

$\therefore PA = PB$

$2\alpha + \cancel{180} - \alpha - \beta = \cancel{180}$

$\therefore \alpha = \beta$

$\square$