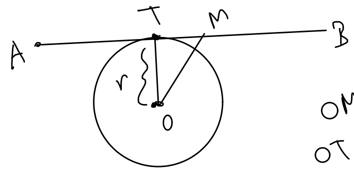
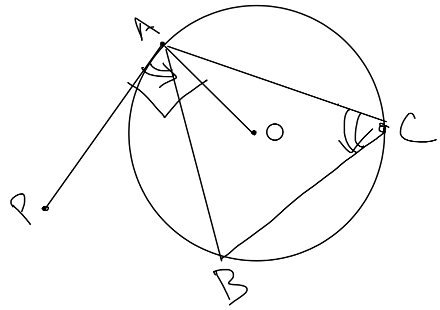
Tangent to a circle :-



$OM > r$
$OT = r$

$\forall M$ in AB such that $M \neq T$

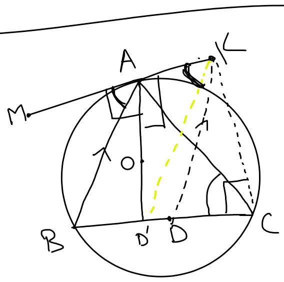
OT is the shortest distance from O to AB $\Longrightarrow OT \perp AB$



$\measuredangle OAB = 90^\circ - \measuredangle BCA$

$\measuredangle PAB = 90^\circ - \measuredangle BAO$
$= - \measuredangle BCA$
$= \measuredangle ACB$

Q>



ΔABC is acute
KA is tangent to (ABC) at A
$\angle KCB = 90^\circ$.
Point D lies on $\overline{BC}$ such that $\overline{KD} \parallel \overline{AB}$. Show that $\overline{DO}$ passes through A.

to show that $D' \equiv D$ by showing $KD' \parallel AB$

Ans:- $\angle BAD' = 90^\circ - \angle MAB$
$= 90^\circ - \angle ACB$

$\angle MAB = \angle ACB$

$\angle D'AM = 90^\circ = \angle D'AK \Longrightarrow AKCD'$ is cyclic
$\Longrightarrow \angle AKD' = \angle ACD' = \angle ACB = \angle MAB$
$\Longrightarrow AB \parallel KD'$

But D is unique so that $AB \parallel KD \Longrightarrow D' \equiv D$

HomeWork

Q> Try to show that in the previous question if A, O, D is collinear and $KD \parallel AB$ then $\angle KCB = 90^\circ$