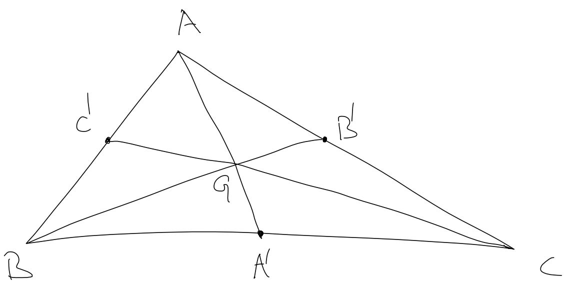
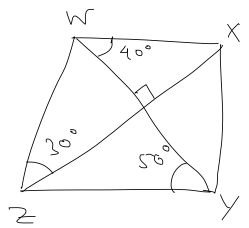


A' is the midpoint of BC
B' is " " " AC
C' is " " " AB

Then AA', BB' and CC' are congruent at G (centroid)

Similarly for orthocentre, circumcentre, incentre

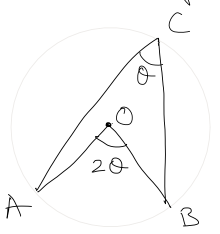
Angle Chasing :-



We have quadrilateral $WXYZ$ with $WY \perp XZ$.
$\angle WZX = 30^\circ$, $\angle XWY = 40^\circ$,
$\angle WYZ = 50^\circ$

Then, $\angle WZY = 180^\circ - 50^\circ - 90^\circ + 30^\circ = 70^\circ$
$\angle WXY = 110^\circ$ (using cyclic quadrilateral)

Theorem:- (Inscribed Angle Theorem)



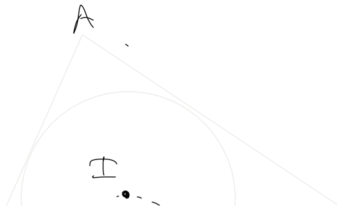
$\angle AOB = 2\angle ACB$

Proof:- $\angle OAC = \angle OCA = \alpha$ $(AO = BO = CO = r)$
$\angle AOC = 180^\circ - \angle OAC - \angle OCA = 180^\circ - 2\alpha$
Similarly, $\angle BOC = 180^\circ - 2\beta$ $(\angle OBC = \angle OCB = \beta)$

$\angle AOB = 360^\circ - \angle AOC - \angle BOC$
$= 360^\circ - 180^\circ + 2\alpha - 180^\circ + 2\beta$
$= 2(\alpha + \beta)$

$\angle ACB = \angle OAC + \angle OCB = \alpha + \beta$

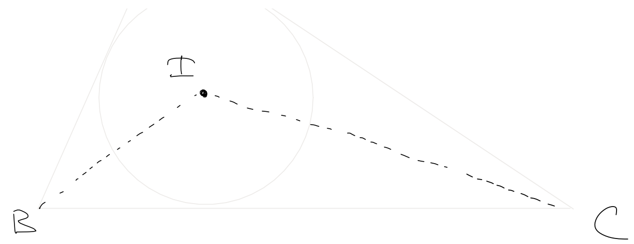
$\Rightarrow \angle AOB = 2\angle ACB$



Q) If I is the incentre of $\triangle ABC$ then show that

Q> If I is the incentre of ΔABC then show that

$\angle BIC = 90^\circ + \frac{1}{2}\angle BAC$



Ans:— $\angle BIC = 180^\circ - (\angle IBC - \angle ICB)$

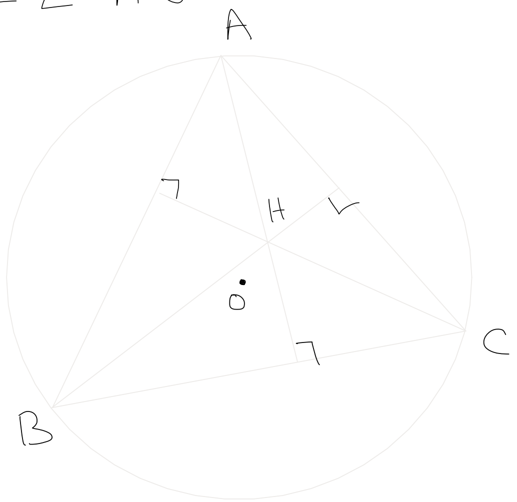
$= 180^\circ - \frac{1}{2}(180^\circ - \angle BAC)$

$= 90^\circ + \frac{1}{2}\angle BAC$

Q> Let ABC be a triangle inscribed in a circle P. Show that $\overline{AC} \perp \overline{CB}$ iff $\overline{AB}$ is a diameter of P.

HomeWork

Q> Let O and H denote the circumcentre and orthocentre of an acute ΔABC, respectively. Show that $\angle BAH = \angle CAO$



O is circumcentre i.e, centre of the circle.

HomeWork

Q> Let $ABCD$ be a cyclic quadrilateral. A line L parallel to BC cuts AB and CD at E and F respectively. Show that $ADFE$ are concyclic.