Important formulae and concepts

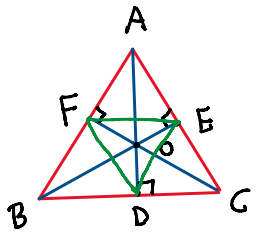
For a ΔABC,

$a, b, c \rightarrow$ sides of the triangle

$A, B, C \rightarrow$ angles of the triangle

$O \rightarrow$ Orthocentre of the triangle

$D, E, F \rightarrow$ foot of the perpendiculars on sides BC, AC & AB



then,

* The 3 altitudes of a triangle are concurrent.
* The common point of intersection of the altitudes of the triangle is called Orthocentre of ΔABC.
* Distance of Orthocentre from the foot of perpendiculars

$OD = 2R\cos B \cdot \cos C$, $OE = 2R\cos A \cdot \cos C$,

$OF = 2R\cos A \cdot \cos B$

* Distance of orthocentre from the vertices of the triangle:→

$OA = 2R\cos A$, $OB = 2R\cos B$, $OC = 2R\cos C$

Pedal Triangle:– ΔDEF

* Sides:→

$EF = a\cos A$, $DF = b\cos B$, $DE = c\cos C$

* Angles:→

$\angle FDE$ (angle opposite to vertex A) $= \pi - 2A$

$\angle DEF$ (angle opposite to vertex B) $= \pi - 2B$)

$\angle EFD$ (angle opposite to vertex C) $= \pi - 2C$

* Area:→

$$\Delta' = \frac{1}{2} R^2 \cdot \sin 2A \cdot \sin 2B \cdot \sin 2C.$$

* The orthocentr is the incentre of the pedal triangle

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