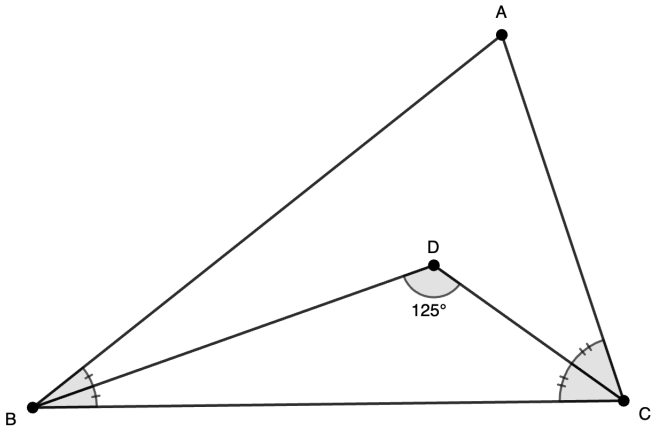
The intersection of the angle bisectors of $\angle B$ and $\angle C$ is shown by point D. If $\angle BDC = 125°$, find the measure of $\angle A$.[1]



[1] Wayoh Kohnodai Girls' High School, Chiba

Solution

Answer : 70°

Proof: Looking at triangle DBC, we can say that $\angle DBC + \angle DCB = 180^\circ - 125^\circ = 55^\circ$. Since DB and DC are each bisectors of $\angle ABC$ and $\angle ACB$, we can also say that $\angle ABC + \angle ACB = 2(\angle DBC + \angle DCB) = 2 \times 55^\circ = 110^\circ$. Therefore, $\angle \mathbf{A} = \mathbf{180} - (\angle \mathbf{ABC} + \angle \mathbf{ACB}) = \mathbf{180}^\circ - \mathbf{110}^\circ = \mathbf{70}^\circ$.