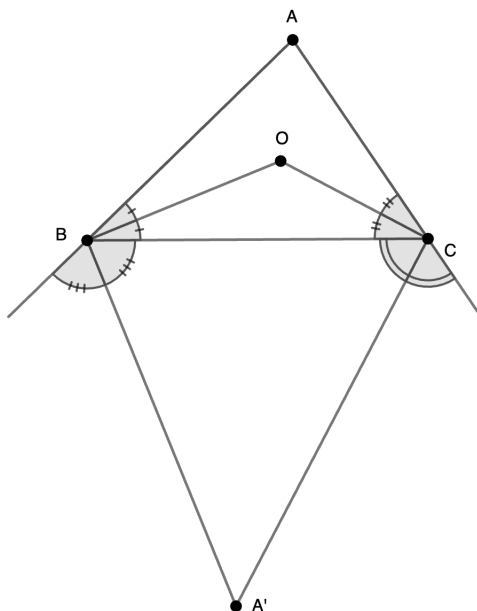In triangle ABC, $\angle B = 44°$, and $\angle C = 56°$. Point O is the intersection of the bisectors of $\angle B$ and $\angle C$. Additionally, point A' is the intersection of the bisectors of the exterior angles of B and C. Find the measure of $\angle BOC$ and $\angle BA'C$.[1]

Solution

Answer : $\angle BOC = 130°, \angle BA'C = 50°$

Proof: $\angle OBC = 44° \div 2 = 22°$. $\angle OCB = 56° \div 2 = 28°$. Therefore, $\angle \mathbf{BOC} = \mathbf{180°} - \mathbf{22°} - \mathbf{28°} - \mathbf{130°}$.

$\angle A'BC = (180° - 44°) \div 2 = 68°$. $\angle A'CB = (180° - 56°) \div 2 = 62°$. Therefore, $\angle \mathbf{BA'C} = \mathbf{180°} - \mathbf{68°} - \mathbf{62°} = \mathbf{50°}$.