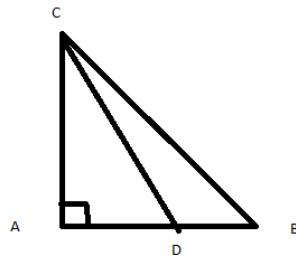


A light house is 300 meter high from the sea level. From the top of the light house the angle of depression of two boats are 30 and 45 degrees .If the line joining the boats passing through the foot of the light house find the distance between the boats when they are on the same side of the light house.

Solution:



According to condition, $AC=300\text{m}$, angle $ACD=30^\circ$, angle $ACB=45^\circ$. Our boats are D and B, so we have to find DB.

Consider the triangle CAB, angle $CAB=90^\circ$. So, angle $CBA= 90-45=45^\circ$. So, $AB=AC=300\text{m}$.

Consider the triangle CAD, angle $CAD=90^\circ$. $\tan(\angle ACD) = \frac{AD}{CA} \Rightarrow AD = CA * \tan(\angle ACD) = 300 * \frac{1}{\sqrt{3}} = 100\sqrt{3}$

So, we can see, that $DB=AB-AD=300-100\sqrt{3}$ (m)

Answer: $300-100\sqrt{3}$ (m)