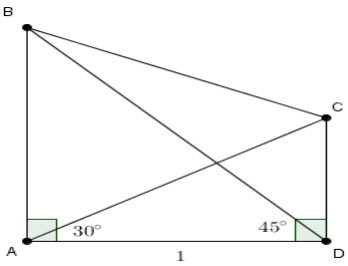
Problem 57

$\overline{AB}$ and $\overline{CD}$ are perpendicular to $\overline{AD}$. $m\angle CAD = 30°$ and $m\angle BDA = 45°$. Find BC to the nearest thousandth:



Answer

$\boxed{1.086}$

Explanation

Setting the coordinates of A as $(0, 0)$ and using $\tan(\theta)$ (or special triangles), we find the coordinates of B as $(0, 1)$ and C as $(1, \frac{1}{\sqrt{3}})$. Using the distance formula, we get:

$BC = \sqrt{(0-1)^2 + (1-\frac{1}{\sqrt{3}})^2} \approx 1.086$