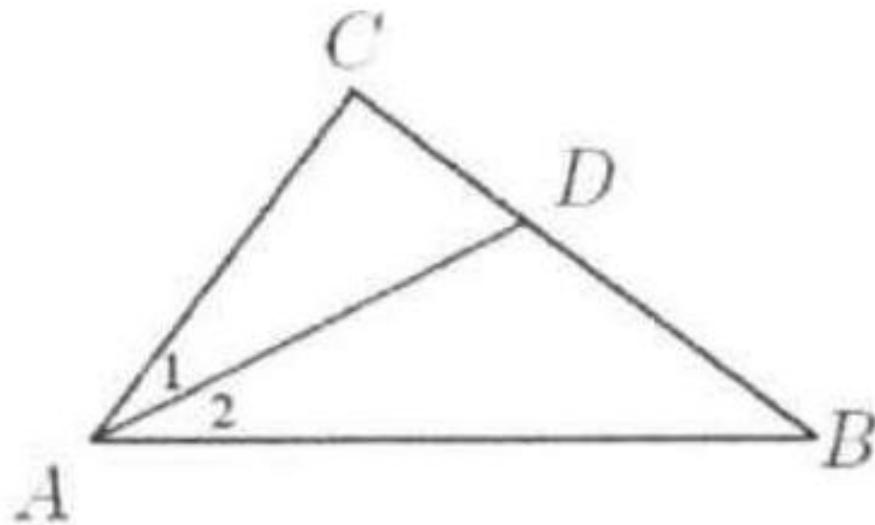


Problem

In triangle ABC , $\angle C = 90^\circ$. $\angle 1 = \angle 2$. $CD : BD = 3 : 5$. Find BC if $AB = 10$ mm.



Solution

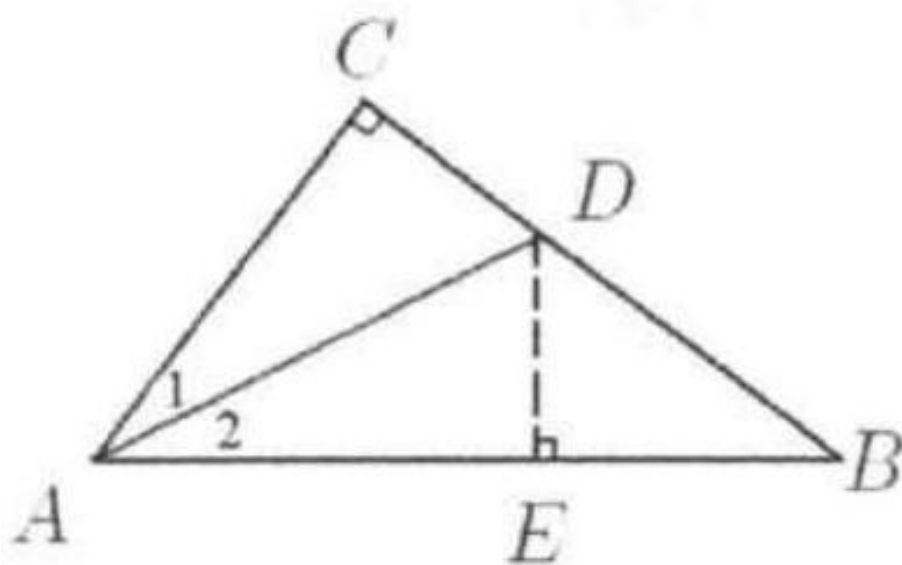
8 mm .

Draw $DE \perp AB$ so that the perpendicular line meets AB at E . $\triangle CAD$ and $\triangle AED$ are congruent and $DE = CD$.

Since $\angle B = \angle B$, $\angle BED = \angle C = 90^\circ$, $\triangle BDE \sim \triangle BAC$.

$$\text{So } \frac{DE}{AC} = \frac{BD}{AB} \Rightarrow \frac{DE}{BD} = \frac{AC}{AB}.$$

$$\text{Since } CD : BD = 3 : 5, \frac{DE}{BD} = \frac{3}{5} \Rightarrow \frac{AC}{AB} = \frac{3}{5}.$$



Since $AB = 10, AC = 6$.
 $BC = \sqrt{AB^2 - AC^2} = \sqrt{10^2 - 6^2} = 8$.