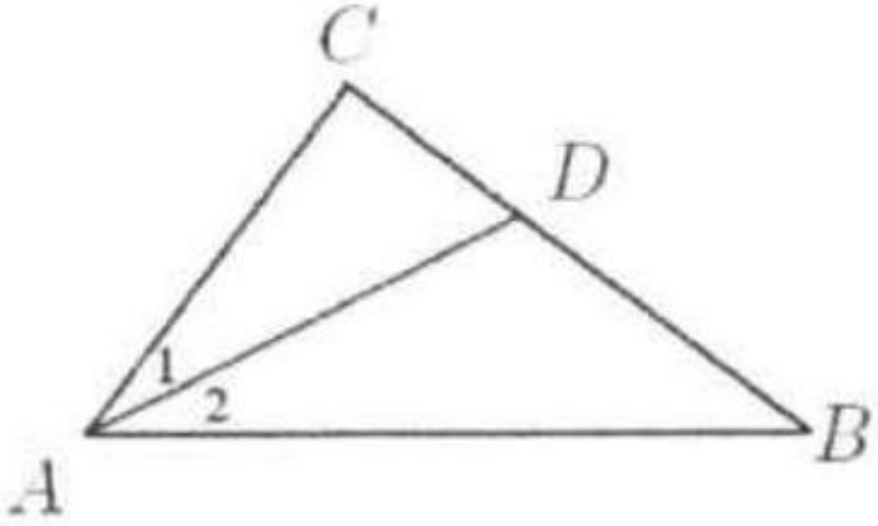
Problem 1

Problem

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



Solution

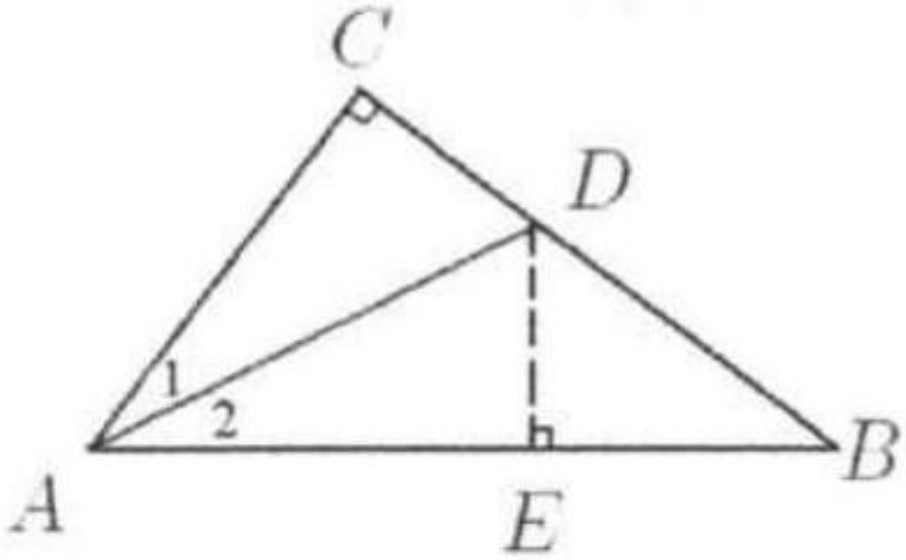
8 mm .

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

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

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

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



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