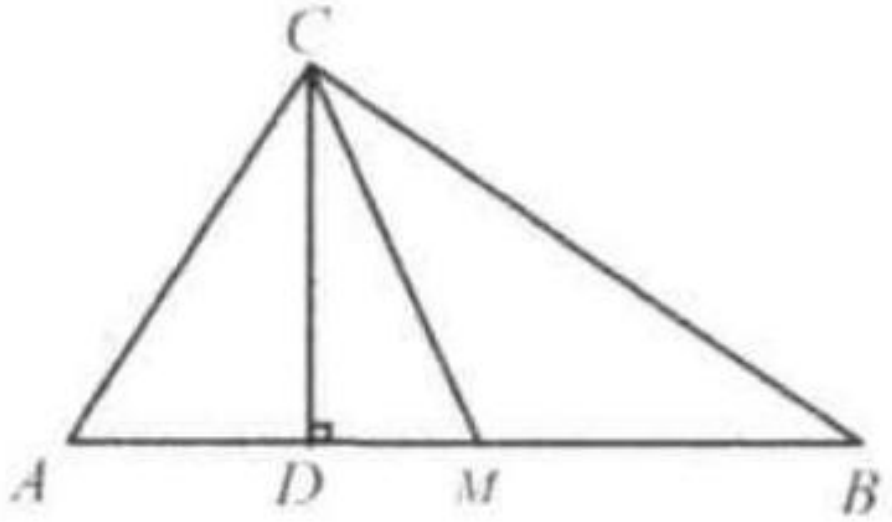
Example 11

In $\triangle ABC, CD$ is altitude and CM is the median. What is the measure of $\angle C$ if CD and CM trisect $\angle C$?

Solution: $90°$.

Draw the perpendicular line MK and $MK \perp BC$ at K.

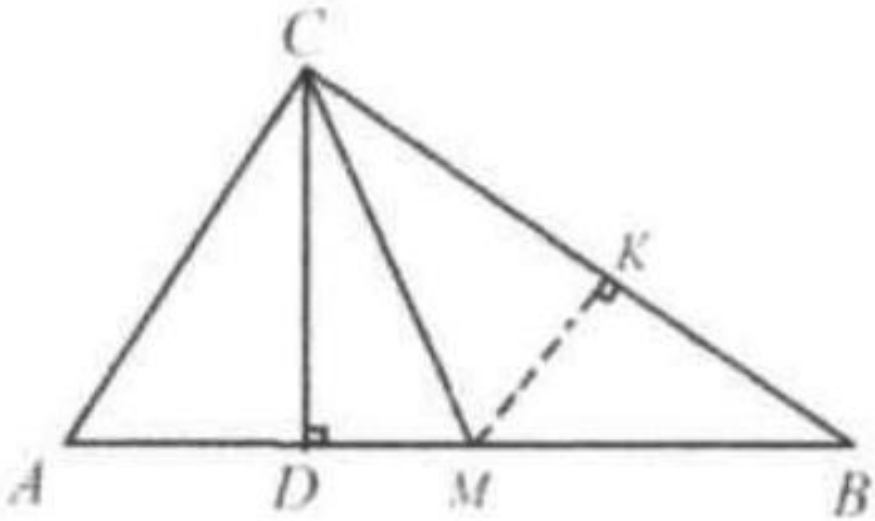


Since $\angle ACD = \angle DCM = \angle MCB, \triangle ACD \cong \triangle DCM \cong \triangle KCM$.

Thus $AD = DM = KM$.

Since CM is the median, $MB = MA = 2DM = 2KM$.

We then know that in right triangle $BKM, \angle B = 30°$.



So in right triangle $BCD, \angle BCD = 60°$.
Then $\angle ACD = \angle DCM = \angle MCB = 30°$ and $\angle ACB = 3 \times 30° = 90°$.