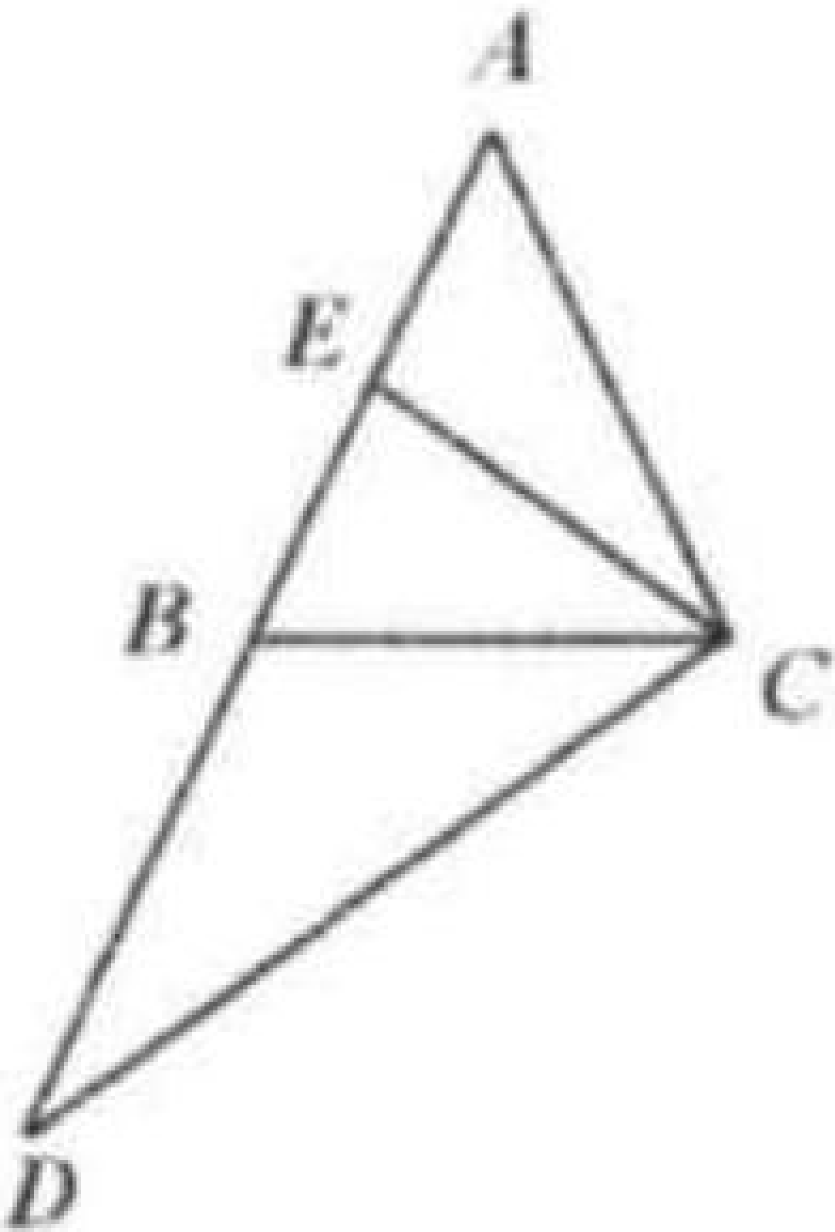
# Example 16

In $\triangle ABC$, point $E$ is the midpoint of $AB$. Extend $AB$ to $D$ such that $AB = BD$. Show that $CD = 2CE$.

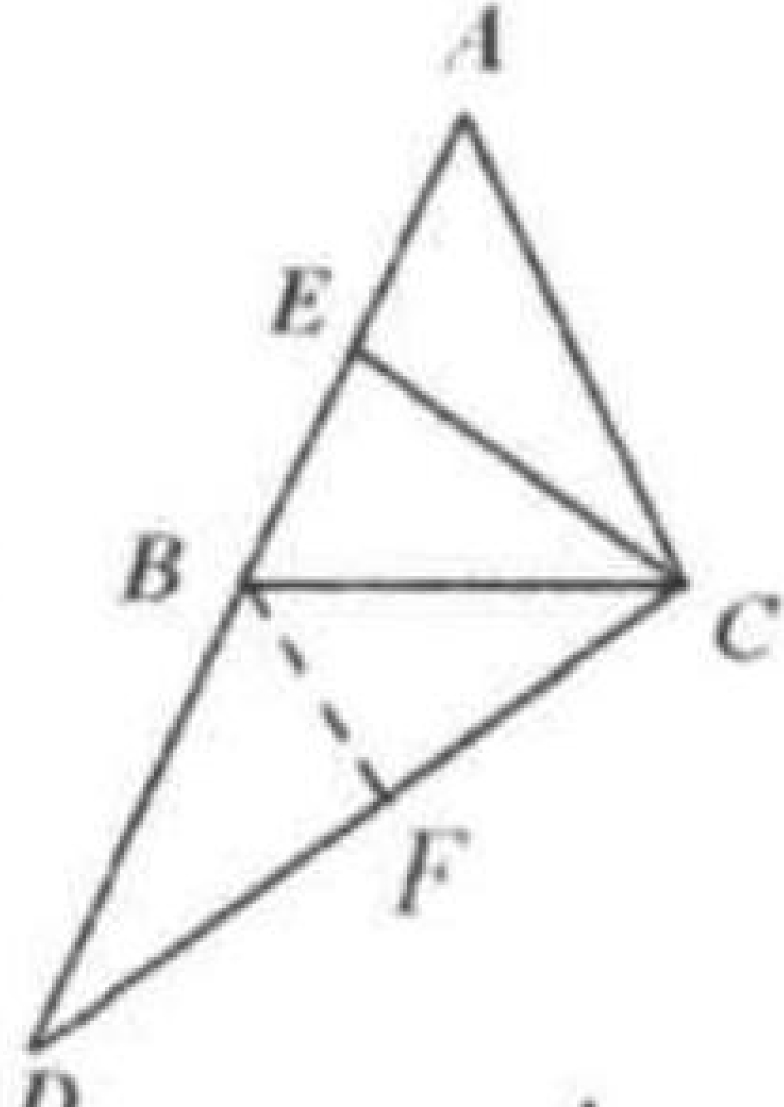
Solution: Draw $BF//AC$ to meet $CD$ at $F$.
Since point $B$ is the midpoint of $AD, F$ is the midpoint of $CD$ and

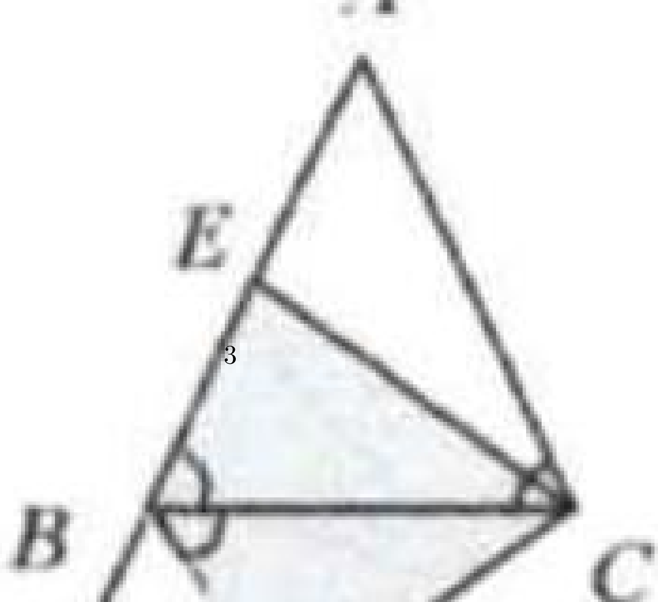



$BF = \frac{1}{2}AC$.

Since point $E$ is the midpoint of $AB, BE = AE$

$\frac{1}{2}AB = \frac{1}{2}AC = BF$.


A
E
B
C
F
D


A
E
B
C

Since $BF//AC, \quad \angle FBC = \angle BCA = \angle CBA. BC = BC.$
Thus $\triangle FBC \cong \triangle EBC.$
Thus $CE = FC = \frac{1}{2}CD \quad \Rightarrow \quad CD = 2CE.$