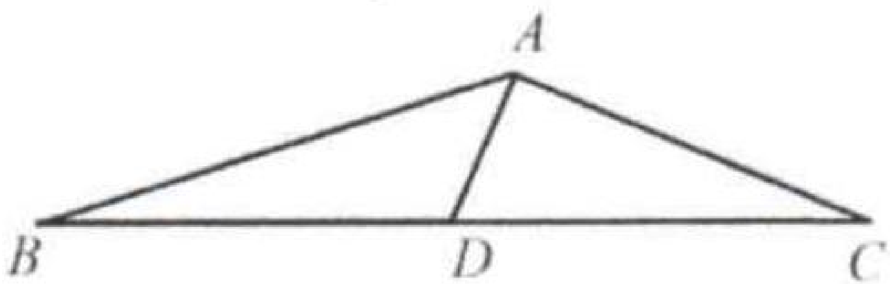
# Example 3

In $\triangle ABC, \angle BAD = 30°. \angle BAC = 120°. D$ is the midpoint of $BC$. Prove: $AB = 2AC$.

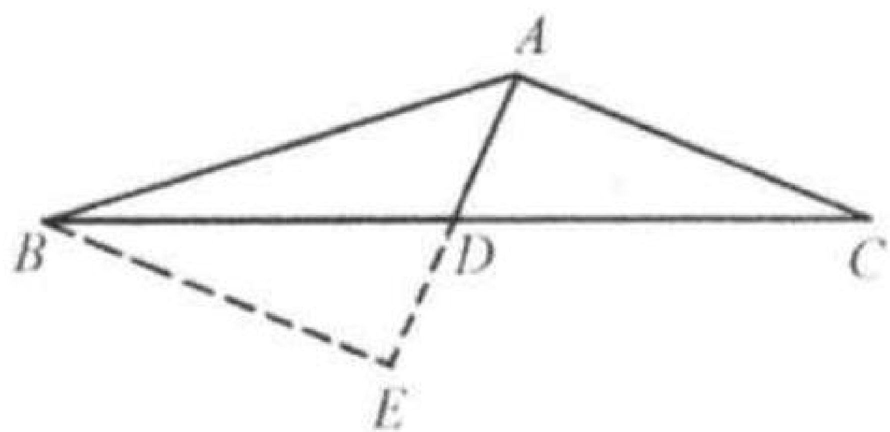
Solution:




Extend $AD$ to $E$ such that $AD = DE$. Connect $BE$.

Since $DE = AD, \angle BDE = \angle CDA. BD = DC$.

Thus $\triangle BDE \cong \triangle CDA, BE = AC$, and $\angle E = \angle DAC$.




Since $\angle BAC = 120°, \angle BAD = 30°, \angle DAC = \angle BAC - \angle BAD = 90°$.

Thus, $\angle E = 90°$.

Since $\angle BAD = 30°, AB = 2AC$.