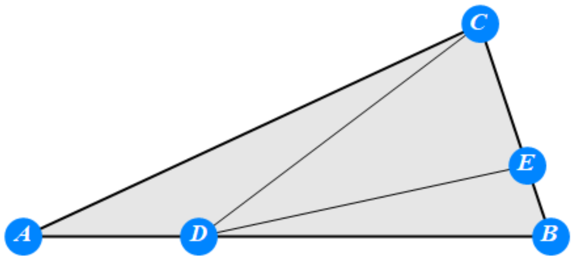
Example 27 : As shown in Figure 1, in $\triangle ABC$, D and E are the three equal points of AB and BC respectively , and $2AD=DB$, $2BE=EC$, if $\angle CDE=\angle CAB$, prove: $\angle EDB=\angle DCA$; $\angle DEC=\angle BCA$; ; $\angle BCD=\angle ABC$ $2\angle DFA=\angle CDF$, where F is the midpoint of BC.



Proof: According to the identity $$\frac{3}{2}\frac{\dfrac{C-\dfrac{2A+B}{3}}{C-A}}{\dfrac{\dfrac{2A+B}{3}-\dfrac{C+2B}{3}}{\dfrac{2A+B}{3}-B}}=\frac{\dfrac{\dfrac{2A+B}{3}-C}{\dfrac{2A+B}{3}-\dfrac{C+2B}{3}}}{\dfrac{A-C}{A-B}}$$ can be obtained $\angle EDB=\angle DCA \Leftrightarrow \angle CDE=\angle CAB$.

According to the identity $$\frac{\dfrac{C-B}{C-A}}{\dfrac{\dfrac{C+2B}{3}-\dfrac{2A+B}{3}}{\dfrac{C+2B}{3}-C}}=2\left(\frac{\dfrac{\dfrac{2A+B}{3}-C}{\dfrac{2A+B}{3}-\dfrac{C+2B}{3}}}{\dfrac{A-C}{A-B}}-1\right)$$ can be obtained $\angle DEC=\angle BCA \Leftrightarrow \angle CDE=\angle CAB$.

According to the identity $$\frac{\dfrac{C-B}{C-\dfrac{2A+B}{3}}}{\dfrac{B-A}{B-C}}=3\left(1-\frac{\dfrac{A-C}{A-B}}{\dfrac{\dfrac{2A+B}{3}-C}{\dfrac{2A+B}{3}-\dfrac{C+2B}{3}}}\right)$$ can be obtained $\angle BCD=\angle ABC \Leftrightarrow \angle CDE=\angle CAB$.