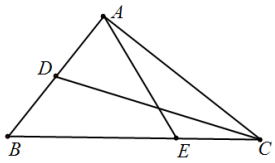
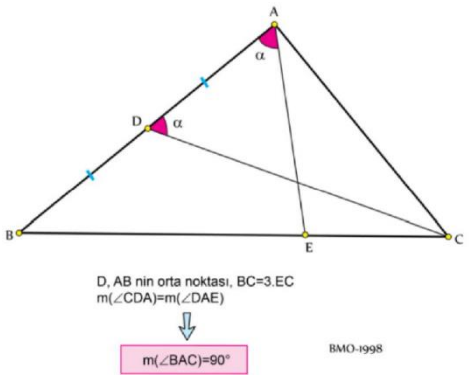
Example 36 : As shown in Figure 1 , in $\triangle ABC$, D is the midpoint of AB , E is the third point of BC , *and* $BE = 2\,EC$, $\angle ADC = \angle BAE$, find $\angle BAC$. (1998 British Mathematical Olympiad test questions)





$$6\frac{A-\dfrac{B+2C}{3}}{\dfrac{A-B}{B-A}}+4\left(\frac{A-C}{A-B}\right)^2=1,$$

$$\frac{A+B}{2}-C$$

Suppose $A=0$, $4\left(\dfrac{C}{B}\right)^2+6\dfrac{\dfrac{B+2C}{3}}{\dfrac{B}{B}}=1.$

$$\frac{B}{2}-C$$

Explanation: According to the identity equation, it can be known $\angle ADC=\angle BAE \Leftrightarrow \angle BAC=90^\circ$.

set $\left[\left(\dfrac{A+B+2C}{4}-A\right)^2-\left(\dfrac{A+B+2C}{4}-\dfrac{A+B}{2}\right)^2\right]-\dfrac{1}{2}(A-B)(A-C)=0$.

where the intersection of AE and CD is $\dfrac{A+B+2C}{4}$.