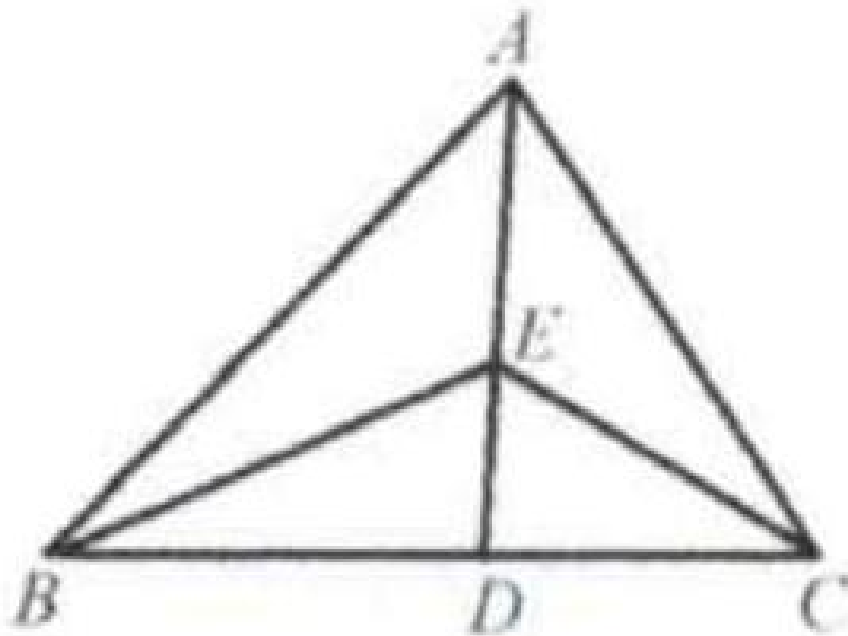


## Example 5

As shown in the figure below, in  $\triangle ABC$ ,  $AB > AC$ .  $AD$  is the angle bisector of  $\angle A$ . Show that  $AB - AC > EB - EC$ .

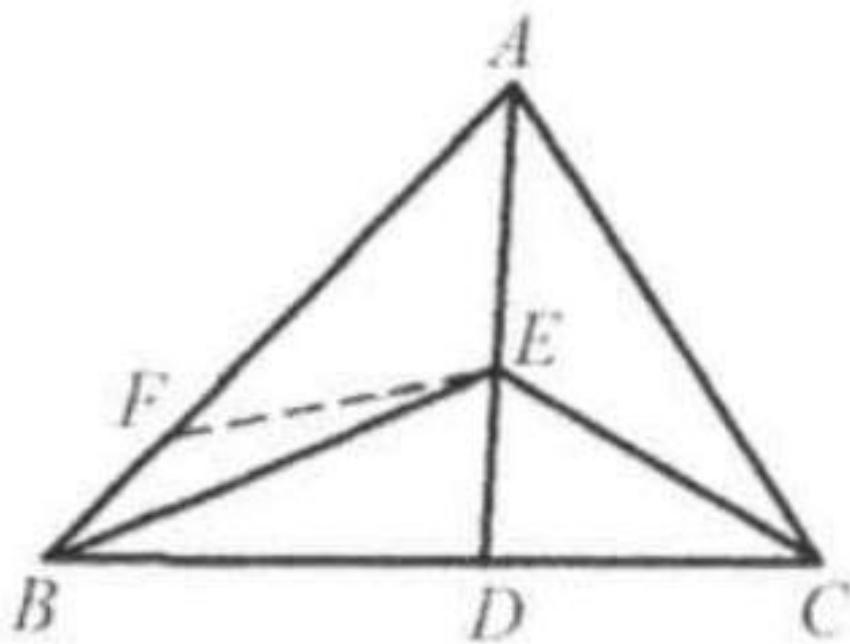
Solution: Take  $F$  on  $AB$  so that  $AF = AC$ .



$$AB - AC = AB - AF = BF.$$

Since  $AD$  is the angle bisector of  $\angle A$ ,  $AE$  is the angle bisector of  $\angle A$ , and  $AF = AC$ ,  $AE = AE$ . So we have  $\triangle AEF \cong \triangle AEC$ . Therefore  $EF = EC$ .

By triangle inequality theorem, in  $\triangle BEF$ ,  $BF > EB - EF =$



$EB - EC$ , or  $AB - AC > EB - EC$ .