

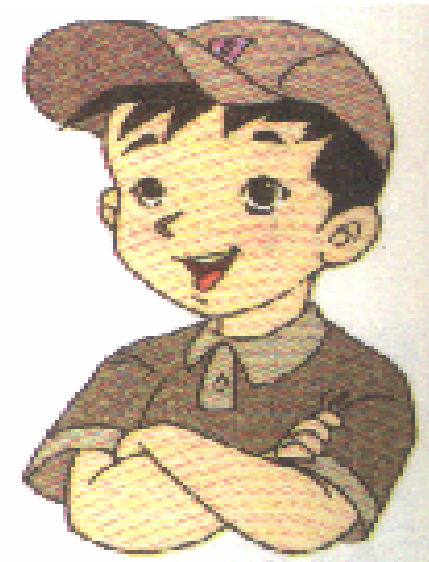


如何证一条线段=两条线段的和



**证明一条线段=两条线段的和，常用的方法通常有三种：**

- ①截      ②接      ③代换.      ④作垂线**

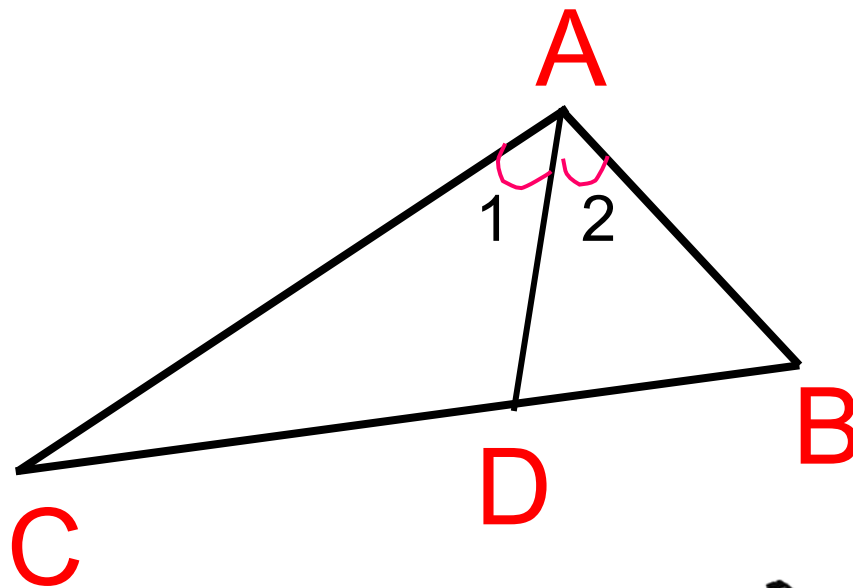


证法一  截

已知: ①  $\angle 1 = \angle 2$

$\angle B = 2\angle C$

求证:  $AC = AB + BD$



已知：①  $\angle 1 = \angle 2$

$\angle B = 2\angle C$

求证： $AC = AB + BD$

证明：在AC上截取

$AE = AB$

在 $\triangle ABD$ 和 $\triangle AED$ 中

$\because$  ①  $AE = AB$

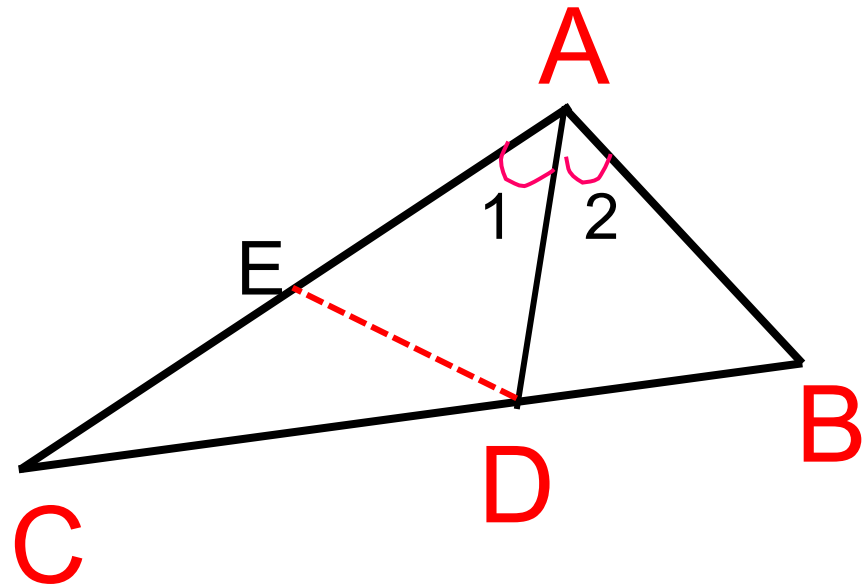
②  $\angle 1 = \angle 2$

③  $AD = AD$

$\therefore \triangle ABD \cong \triangle AED$

$\angle B = \angle AED$ 、 $BD = ED$

$\therefore \angle B = 2\angle C$



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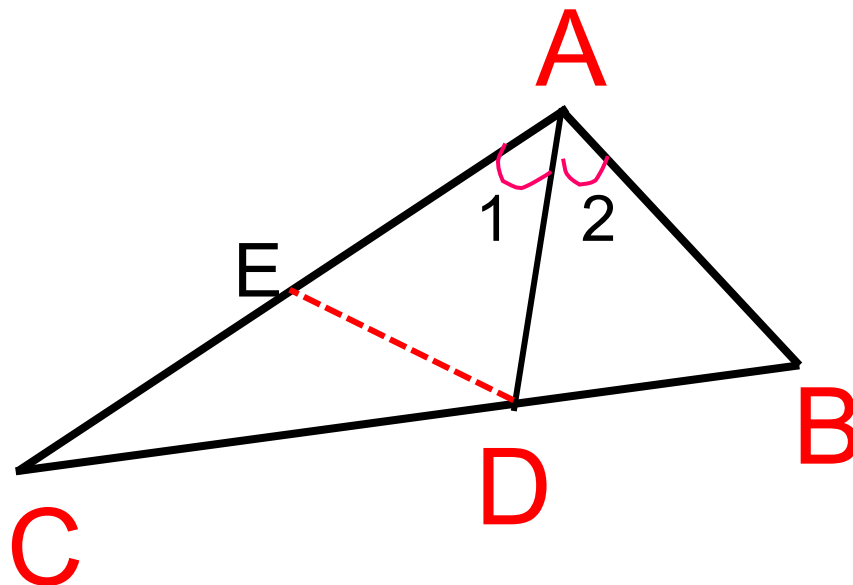
②  $\angle 1 = \angle 2$

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$\therefore \triangle ABD \cong \triangle AED$

$\angle B = \angle AED$ 、 $BD = ED$

$\therefore \angle B = 2\angle C$



$\therefore \angle AED = 2\angle C$

$\therefore \angle AED = \angle C + \angle EDC$

$\therefore \angle C = \angle EDC$

$\therefore EC = ED$

又  $ED = BD$

$\therefore EC = BD$

$\therefore AC = AE + EC$

$\therefore AC = AB + BD$

证法二  $\longrightarrow$  接

已知: ①  $\angle 1 = \angle 2$

②  $\angle B = 2\angle C$

求证:  $AC = AB + BD$

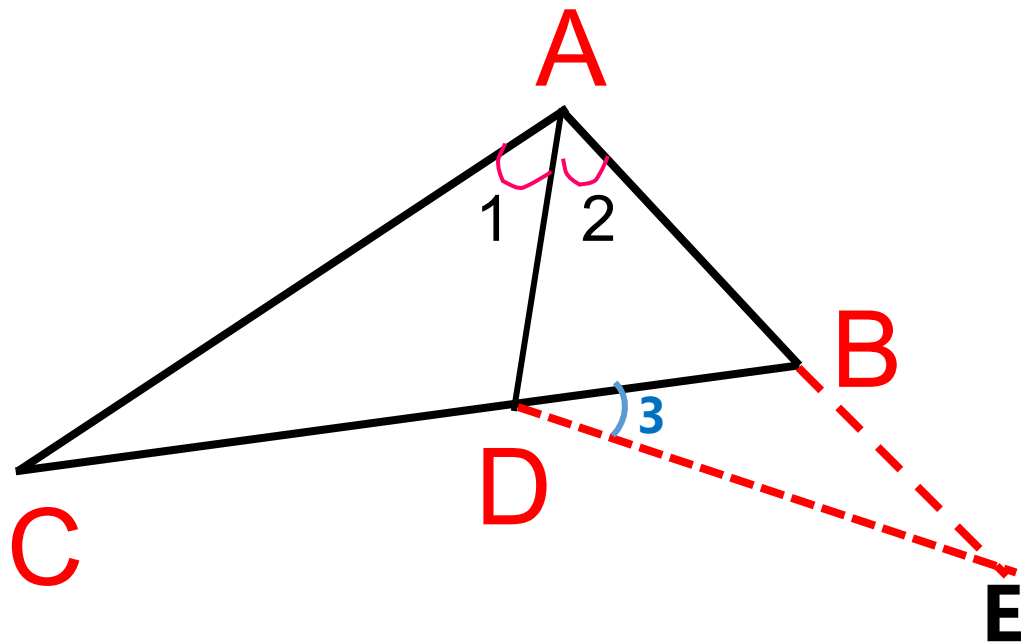
证明: 延长AB到E, 使  
 $BE = BD$ , 连结DE. 则

$\angle 3 = \angle E$ .

$\therefore \angle ABC = 2\angle E$

又  $\angle ABC = 2\angle C$

$\therefore \angle C = \angle E$ .



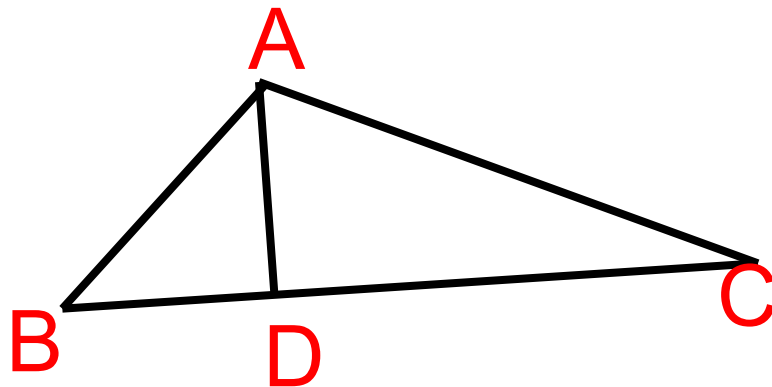
# 趁热打铁



**已知:** ①  $\angle B = 2\angle C$

②  $AD \perp BC$

**求证:**  $DC = AB + BD$



已知：①  $\angle B = 2\angle C$

②  $AD \perp BC$

求证： $DC = AB + BD$

证明：在  $DC$  上截取  
 $DE = DB$ .

$\because AD \perp BC$

$\therefore \angle ADB = \angle ADE = 90^\circ$

在  $\triangle ADB$  和  $\triangle ADE$  中

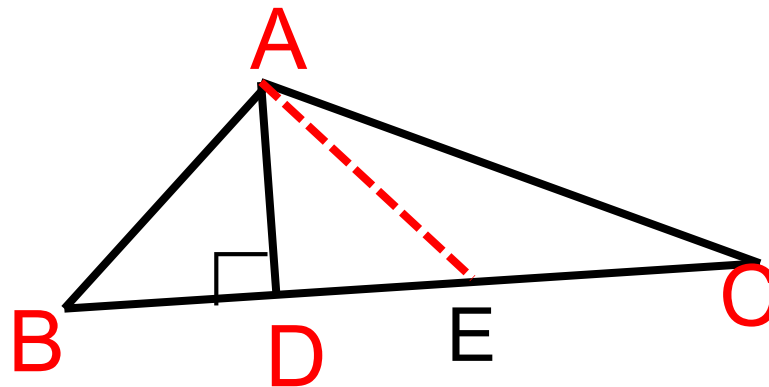
$\because$  ①  $BD = DE$

②  $\angle ADB = \angle ADE$

③  $AD = AD$

$\therefore \triangle ADB \cong \triangle ADE$

$\therefore \angle B = \angle AED, AB = AE$





已知：①  $\angle B = 2\angle C$

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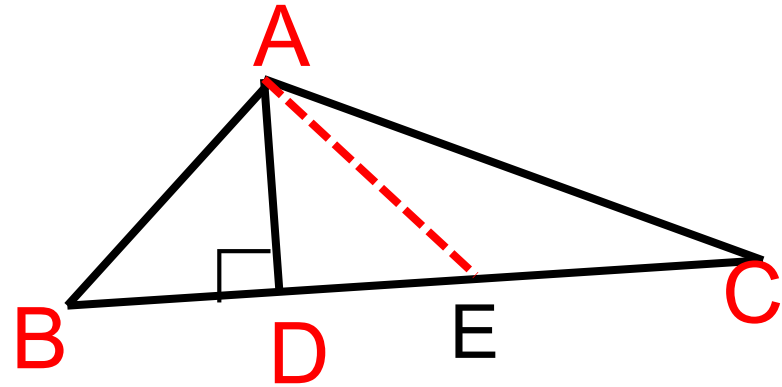
$\therefore$  ①  $BD = DE$

②  $\angle ADB = \angle ADE$

③  $AD = AD$

$\therefore \triangle ADB \cong \triangle ADE$

$\therefore \angle B = \angle AED, AB = AE$



$\because \angle B = 2\angle C$

$\therefore \angle AED = 2\angle C$

$\because \angle AED = \angle C + \angle CAE$

$\therefore \angle C = \angle CAE$

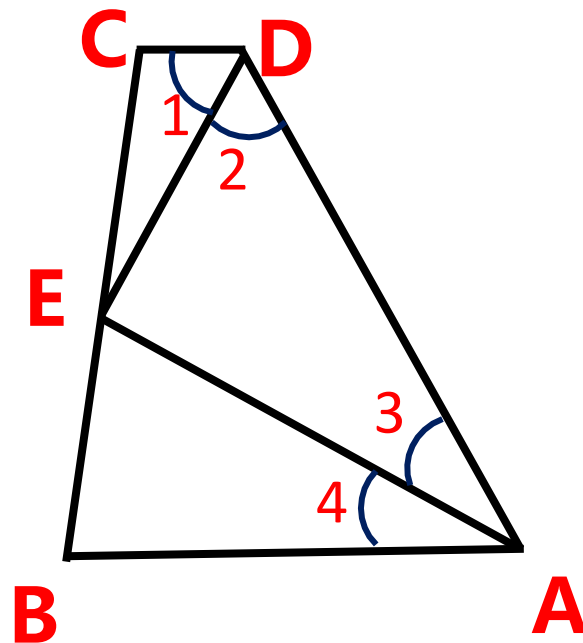
$\therefore AE = EC$

$\therefore DC = DE + EC$

$\therefore DC = DB + AB.$

**已知** :  $AB \parallel CD$ ,  $DE$  平分  $\angle ADC$ ,  $BC$  过点  $E$ ,  $AE$  平分  $\angle BAD$ .

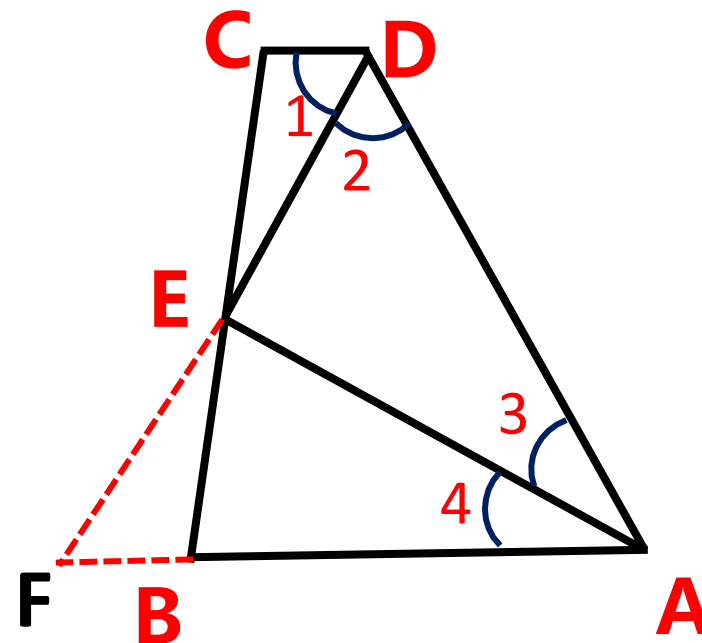
**求证** :  $E$  是  $BC$  的中点,  
 $AD = AB + CD$ .



**已知** :  $AB \parallel CD$ ,  $DE$  平分  $\angle ADC$ ,  $BC$  过点  $E$ ,  $AE$  平分  $\angle BAD$ .

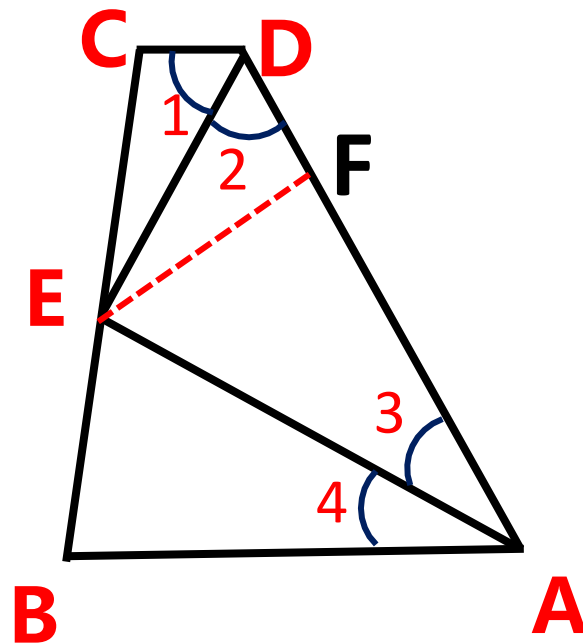
**求证** :  $E$  是  $BC$  的中点,  
 $AD = AB + CD$ .

**证法一** : 分别延长  $DE, AB$  交点为  $F$



**已知** :  $AB \parallel CD$ ,  $DE$  平分  $\angle ADC$ ,  $BC$  过点  $E$ ,  $AE$  平分  $\angle BAD$ .

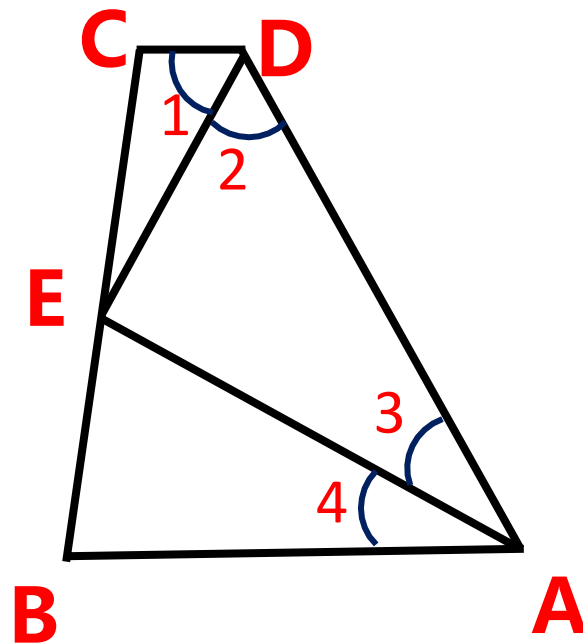
**求证** :  $E$  是  $BC$  的中点,  
 $AD = AB + CD$ .



**证法二** : 在  $AD$  上截取  $AF = AB$

探究发现： → 提取6条信息

- (1)  $AB \parallel CD$ ,
- (2)  $DE$ 平分  $\angle ADC$ ,
- (3)  $BC$ 过点 $E$ ,  $AE$ 平分  $\angle BAD$ .
- (4)  $E$ 是 $BC$ 的中点,
- (5)  $AD = AB + CD$ .
- (6)  $DE \perp AE$



把任意三个作为已知条件，可证得其余三个成立。

本节课你有  
什么收获？



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