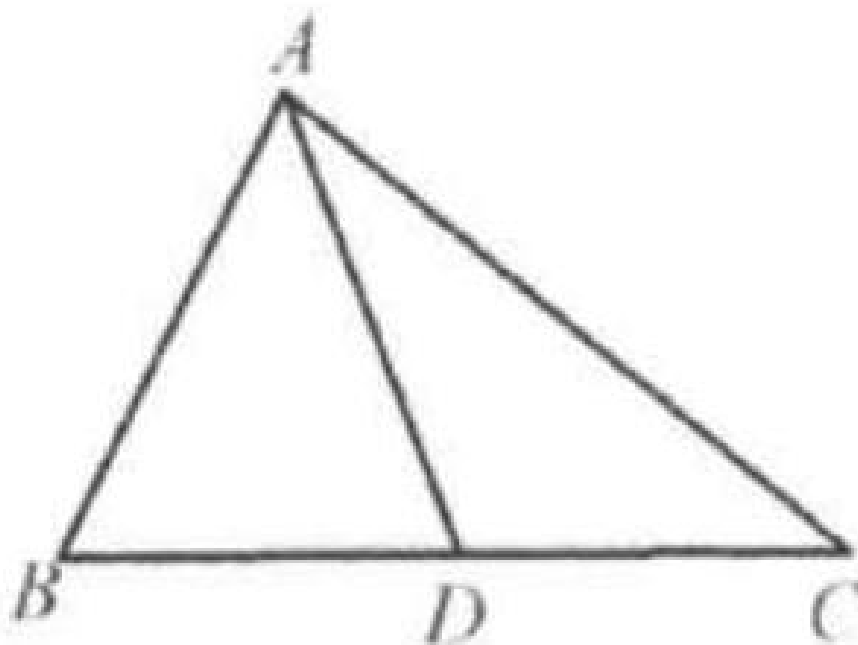


## Example 4

In  $\triangle ABC$ ,  $AB = 7$ ,  $AC = 11$ .  $AD$  is the median on side  $BC$ . How many integer values are there of  $AD$  ?

Solution: 6.



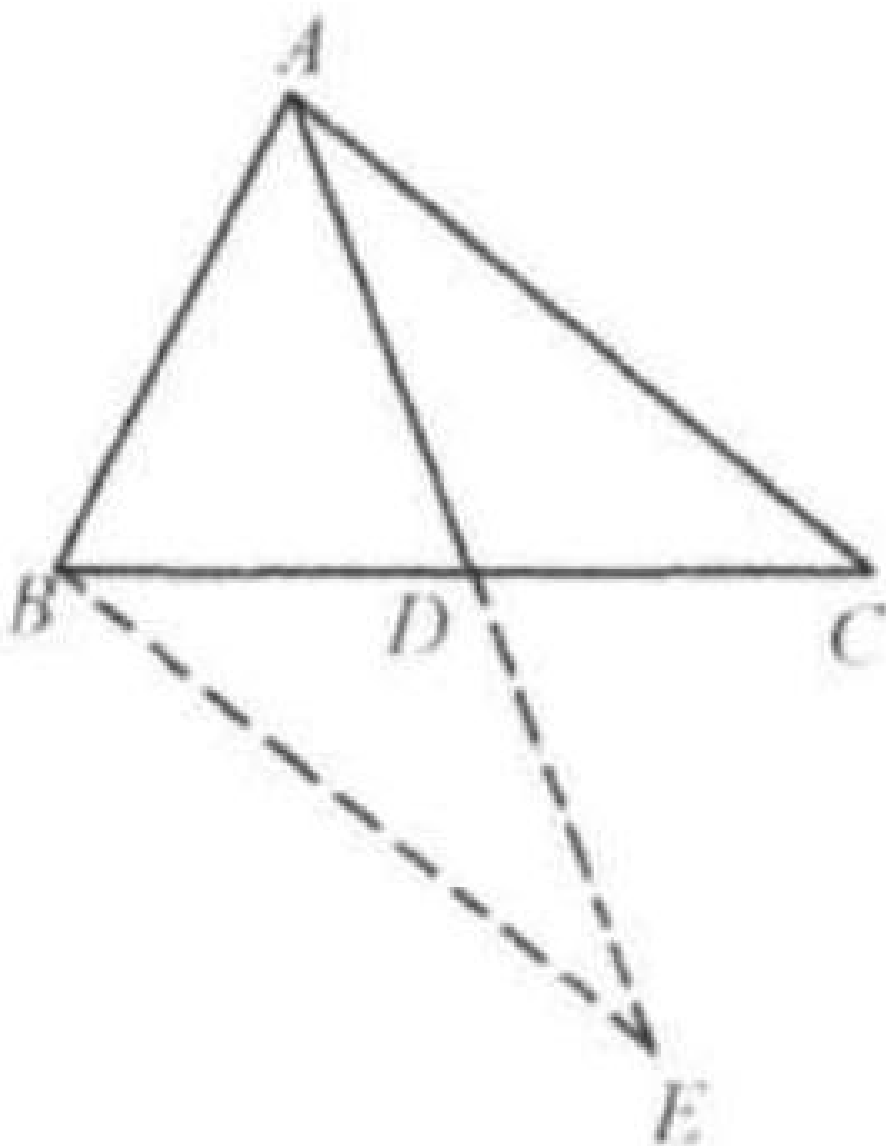
Extend  $AD$  to  $E$  such that  $AD = DE$ .

Connect  $BE$ .

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

Thus  $\triangle BDE \cong \triangle CDA$ ,  $BE = AC = 11$ .

By the triangle inequality theorem,



$$11 - 7 < AE < 11 + 7 \Rightarrow 4 < 2AD < 18 \Rightarrow 2 < AD < 9.$$

There are six possible values: 3, 4, 5, 6, 7, and 8 .