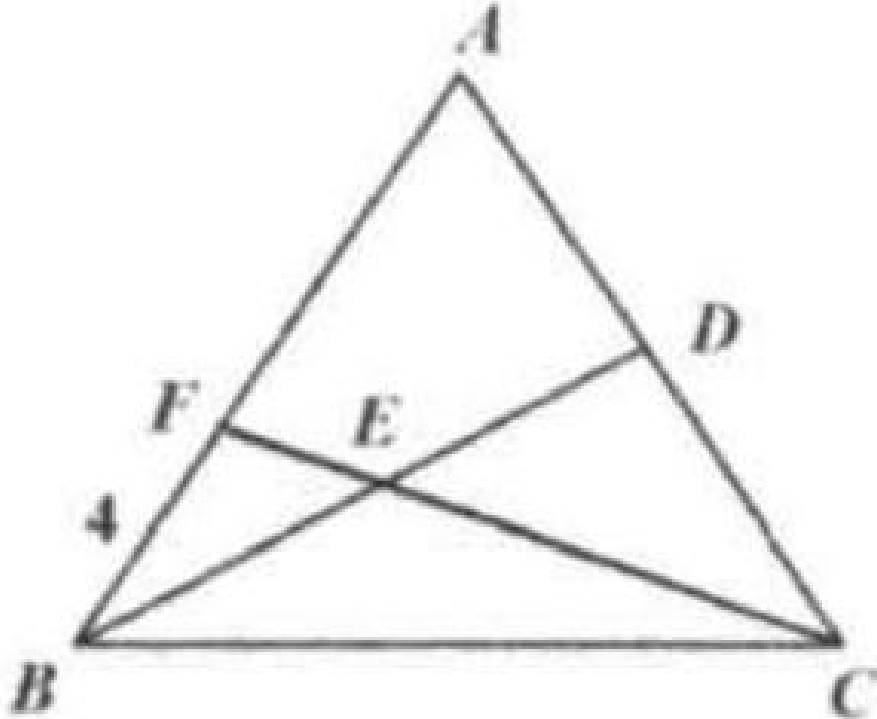


## Problem

As shown in the figure, in triangle  $ABC$ , median  $BD$  intersects  $CF$  at  $E$  such that  $BF = 4$  and  $BE = ED$ . Find the length of  $BA$ .

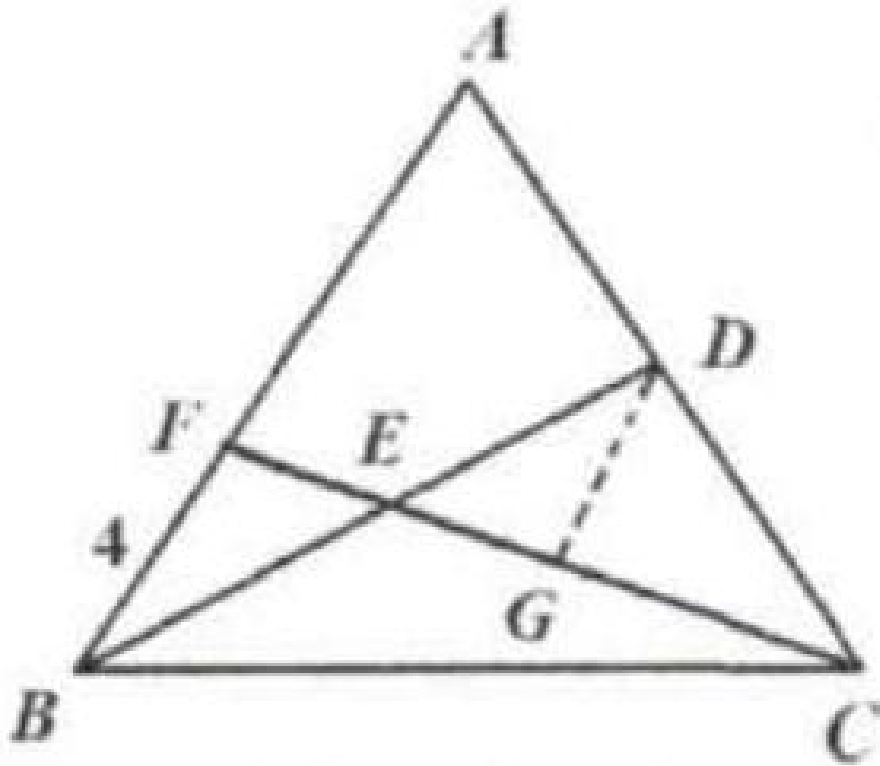


## Solution

12.

Method 1:

Draw  $DG \parallel AB$  to meet  $CF$  at  $G$ . Since  $D$  is the midpoint of  $AC$ ,  $AF = 2DG$ .



Since  $BE = ED$ ,  $\angle EBF = \angle EDG$  (alternate interior angles) and  $\angle BEF = \angle DEG$  (vertical angles),  $\triangle EFB \cong \triangle EGD$  and  $DG = BF = 4$ .  $AF = 2DG = 8$ .  $AB = 4 + 8 = 12$ .

Method 2:

Pick up a point  $G$  on  $EC$  such that  $FE = EG$ . Connect  $D$  with  $G$ . Since  $FE = EG$  and  $BE = ED$  (diagonal bisects each other),  $FDGB$  is a parallelogram. Thus  $DG = 4$ ,  $AF = 8$ ,  $AB = 12$ .

