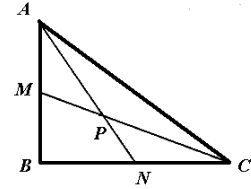
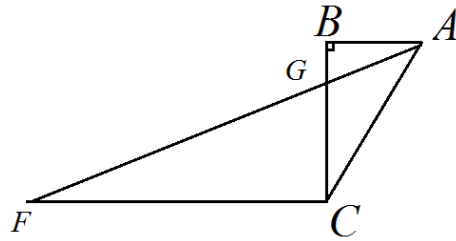


**Example 1.** In right triangle  $ABC$ ,  $M$  and  $N$  are midpoints of legs  $\overline{AB}$  and  $\overline{BC}$ , respectively. Leg  $\overline{AB}$  is 6 units long, and leg  $\overline{BC}$  is 8 units long. How many square units are in the area of  $\triangle APC$ ? (Mathcounts Competitions)

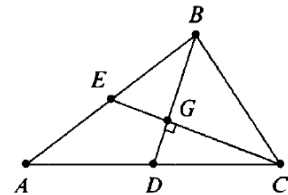


**Example 2.** (AMC) Let line  $AC$  be perpendicular to line  $CE$ . Connect  $A$  to the midpoint  $D$  of  $CE$ , and connect  $E$  to the midpoint  $B$  of  $AC$ . If  $AD$  and  $EB$  intersect in point  $F$ , and  $BC = CD = 15$  inches, find the area of triangle  $DFE$  in square inches.

**Example 3.** In right  $\triangle ABC$ ,  $\angle B = 90^\circ$ ,  $\angle BAC = 78^\circ$ . Draw  $CF \parallel AB$ . Connect  $AF$  and  $BC$ .  $BC$  and  $AF$  meet at  $G$ . If  $FG = 2AC$ , find  $\angle BAG$ .

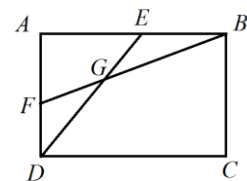


**Example 4.** (AMC) Medians  $BD$  and  $CE$  of a triangle  $ABC$  are perpendicular,  $BD = 8$ , and  $CE = 12$ . Find the area of triangle  $ABC$ .

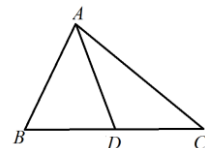


**Example 5.**  $ABCD$  is a rectangle with  $AB = 2BC$ .  $E$  and  $F$  are the midpoints of  $AB$  and  $AD$ , respectively.  $DE$  and  $BF$  meet at  $G$ . What is the ratio of the area of  $GBCD$  to the area of  $ABCD$ ?

- (A)  $\frac{5}{2}$       (B)  $\frac{2}{5}$       (C)  $\frac{2}{3}$       (D)  $\frac{4}{5}$       (E)  $\frac{3}{5}$



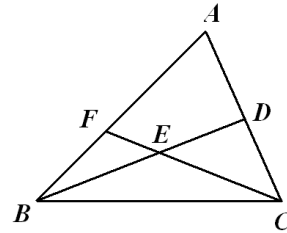
**Example 6.** In  $\triangle ABC$ ,  $AB = 7$ .  $AC = 11$ .  $AD$  is the median on side  $BC$ . How many integer values are there of  $AD$ ?



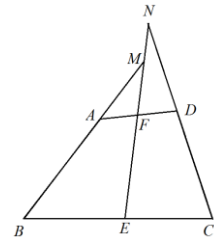
**Example 7.** (AMC) In triangle  $ABC$ ,  $BD$  is a median.  $CF$  intersects  $BD$  at  $E$  so that the length of  $BE$  is equal to the length of  $ED$ . Point  $F$  is on  $AB$ . Then, if  $BF = 5$ ,

$BA$  equals:

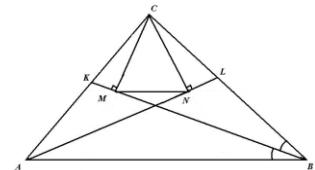
- (A) 10 (B) 12 (C) 15 (D) 20 (E) none of these



**Example 8.**  $ABCD$  is a convex quadrilateral.  $AB = CD$ .  $E, F$  are midpoints of  $BC, AD$ , respectively. The extensions of  $BA$  and  $CD$  meet the extension of  $EF$  at  $M, N$ , respectively. Find the measure of  $\angle BME$  if  $\angle CNE = 35^\circ$ .



**Example 9.** (AIME I) In triangle  $ABC$ ,  $AB = 125$ ,  $AC = 117$  and  $BC = 120$ . The angle bisector of angle  $A$  intersects  $BC$  at point  $L$ , and the angle bisector of angle  $B$  intersects  $AC$  at point  $K$ . Let  $M$  and  $N$  be the feet of the perpendiculars from  $C$  to  $BK$  and  $AL$ , respectively. Find  $MN$ .



Keys:

1. 8 (square units)

2. (C).

3.  $26^\circ$ .

4. 64.

5. (C).

6. 6.

7. (C).

8.  $35^\circ$ .

9. 56.

<http://samsmathclub.com/Forum/index.php>