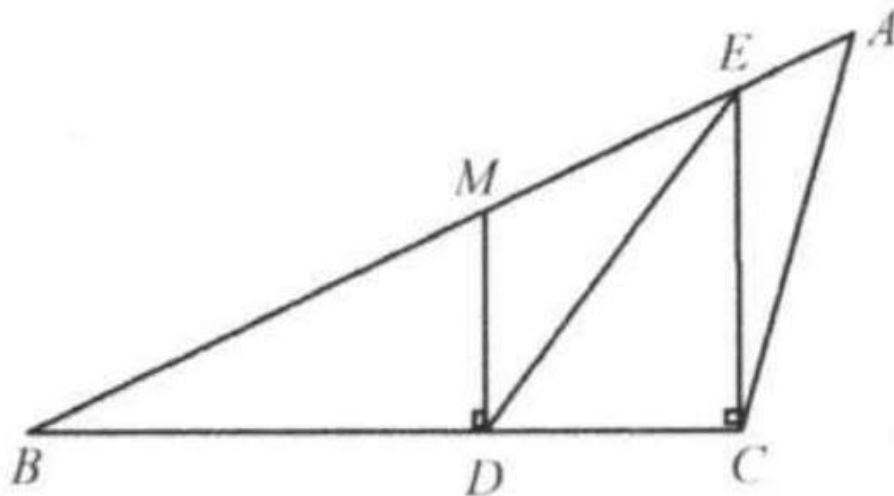


Problem

(AMC) In the obtuse triangle ABC , $AM = MB$, $MD \perp BC$, $EC \perp BC$. If the area of $\triangle ABC$ is 24 , find the area of $\triangle BED$.



Solution

E. Let E and F be the feet of the perpendicular from B and C to AD .

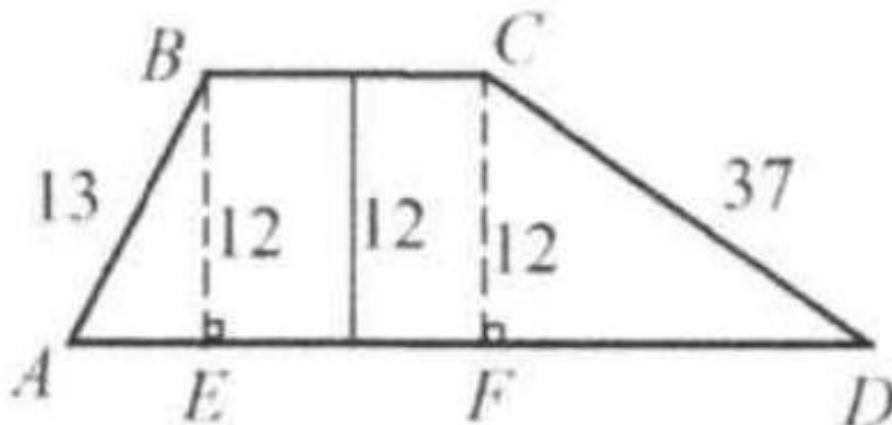
Applying

Pythagorean Theorem to right $\triangle ABE$, $AE^2 = AB^2 - BE^2 = 13^2 - 12^2 = 5^2$.

So $AE = 5$.

Applying Pythagorean Theorem to right $\triangle DCF$,
 $DF^2 = DC^2 - CF^2 = 37^2 - 12^2 = 35^2$. So $DF = 35$.

The trapezoid has area $\frac{BC+AD}{2} \times 12 = 318 \Rightarrow$



$$\begin{aligned}
& BC + AE + EF + DF = 53 \\
\Rightarrow & BC + 5 + BC + 35 = 53 \Rightarrow BC = \frac{13}{2}
\end{aligned}$$