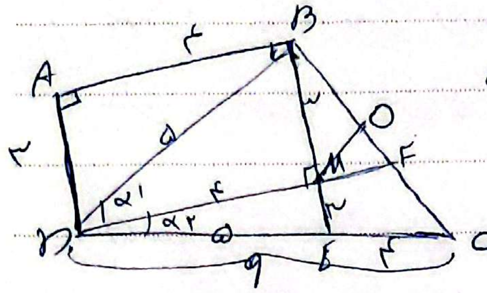
Date: Sub: کتا هندسی بنام خدا

۱-

$DE \parallel BC \longrightarrow \frac{AB}{AD} = \frac{AC}{AE} = \frac{BC}{DE} = \frac{۱۲}{۵}$ $\frac{S_{B\hat{C}E}}{S_{B\hat{D}E}} = \frac{\frac{۱}{۲} \times h \times BC}{\frac{۱}{۲} \times h \times DE} = \boxed{۲/۴}$

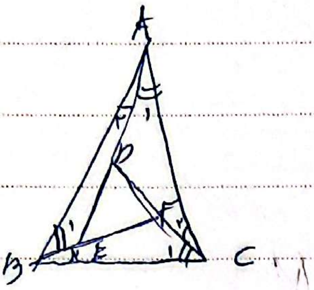


۲- $\hat{A} = ۹۰$ و $BE \parallel AD, DF \parallel AB \rightarrow ABMD$ مستطیل

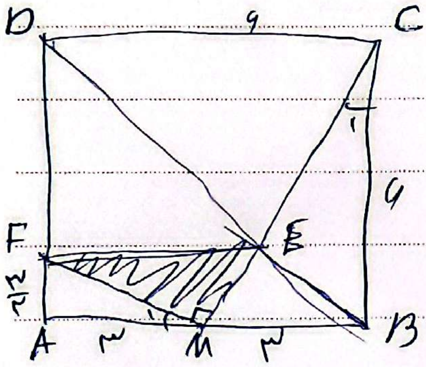
$\hat{D}_۱ = \hat{D}_۲ \longrightarrow M\overset{\triangle}{D}B \cong M\overset{\triangle}{D}E \rightarrow MB = ME = ۳$

$\frac{BM}{BE} = \frac{MO}{EC} = \frac{۳}{۶} \longrightarrow \boxed{MO = ۲}$

۳- $\frac{AB}{۳} = \frac{۸}{۲/۵} \rightarrow AB = \boxed{۹/۶}$



$$\left.\begin{aligned} \hat{E} &= \hat{A}_۲ + \hat{B}_۱ \\ \hat{F} &= \hat{C}_۱ + \hat{B}_۲ \\ \hat{D} &= \hat{A}_۱ + \hat{C}_۲ \end{aligned}\right\} \xrightarrow{\hat{B}_۱ = \hat{C}_۱ = \hat{A}_۱} \begin{aligned} \hat{E} &= \hat{A} \\ \hat{F} &= \hat{B} \\ \hat{D} &= \hat{C} \end{aligned}$$



۴-

$$\left.\begin{aligned} \hat{C}_۱ &= \hat{M}_۱ \\ \hat{B} &= \hat{A} = ۹۰ \end{aligned}\right\} \rightarrow \frac{CB}{MB} = \frac{AM}{AF} = ۲$$

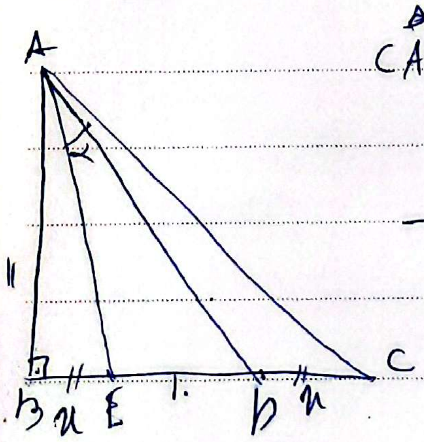
$FM = \sqrt{۹ + \frac{۹}{۴}} = \frac{\sqrt{۴۵}}{۲}$

$D\overset{\triangle}{C}E \sim M\overset{\triangle}{E}B$ → $MC = \sqrt{۹ + ۳۶} = \sqrt{۴۵}$ → $\frac{\sqrt{۴۵}}{۳} = ME$

$S_{M\overset{\triangle}{E}F} = \frac{۱}{۲} \times \sqrt{۴۵} \times \frac{\sqrt{۴۵}}{۲} = \boxed{\frac{۱۵}{۴}}$

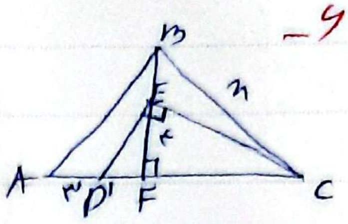
۵- $C\overset{\triangle}{A}E \sim A\overset{\triangle}{E}D \longrightarrow \frac{AE}{ED} = \frac{EC}{AE} \longrightarrow \frac{\sqrt{x^۲ + ۱۲۱}}{۱۰} = \frac{x + ۱۰}{\sqrt{x^۲ + ۱۲۱}}$

$\longrightarrow x^۲ + ۱۲۱ = ۱۰x + ۱۰۰ \longrightarrow \boxed{x = ۳ و ۷}$

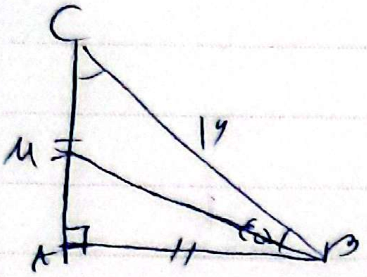


$BC = x \qquad EF^۲ = DF \times CF \rightarrow ۱۶ = CF$ ۶-

$x^۲ = CF \times AC \rightarrow x^۲ = ۱۶ \times ۲ \rightarrow \boxed{x = ۸\sqrt{۵}}$

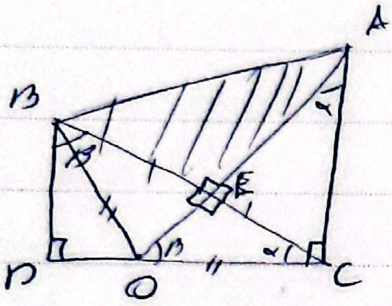


میانه وارد بر قاعده نصف وتر آن ← قائم الزاویه متساوی الساقین ۷-



$AB = \frac{۱۶}{\sqrt{۲}} = ۸\sqrt{۲} \qquad AM = ۴\sqrt{۲}$

$BM = \sqrt{(۴\sqrt{۲})^۲ + (۸\sqrt{۲})^۲} = \boxed{۴\sqrt{۱۰}}$



$BO = CO \rightarrow BC$ عمودمنصف AO ۸-

$\tan\alpha = \frac{۱}{۲} \ (I) \qquad BC = ۲\sqrt{۵} \qquad BE = \sqrt{۵} = EC \ (II)$

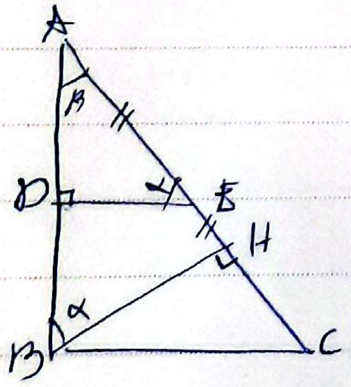
$I, II \rightarrow OE = \frac{\sqrt{۵}}{۲} \rightarrow OC = \frac{۵}{۲} \xrightarrow{I} AC = ۵$

$\rightarrow AO = \frac{۵\sqrt{۵}}{۲} \rightarrow AE = \frac{۵\sqrt{۵}}{۲} - \frac{\sqrt{۵}}{۲} = \frac{۴\sqrt{۵}}{۲}$

$S_{B\hat{E}A} = \frac{۱}{۲} \times \frac{۴\sqrt{۵}}{۲} \times \sqrt{۵} = \boxed{۵}$

$BC^۲ = BD \times AB \qquad ۹ = BD\sqrt{۹۰} \rightarrow BD = \frac{۸۱}{\sqrt{۹۰}} = \frac{۲۷}{\sqrt{۱۰}}$ ۹-

$BD^۲ = BE \times BC \rightarrow \frac{۲۷ \times ۲۷}{۱۰} = BE \times ۹ \rightarrow \boxed{BE = ۸٫۱}$



$AC = ۲۰ \qquad BH \times AC = AB \times BC \rightarrow BH = ۹٫۶$ ۱۰-

$AH = \sqrt{۱۶^۲ - ۹٫۶^۲} = \boxed{۶٫۴}$

$A\hat{D}E \simeq A\hat{H}B \rightarrow \frac{DE}{BH} = \frac{AE}{AB} \rightarrow \boxed{DE = ۳٫۸۴}$