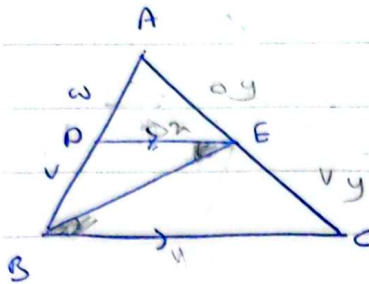
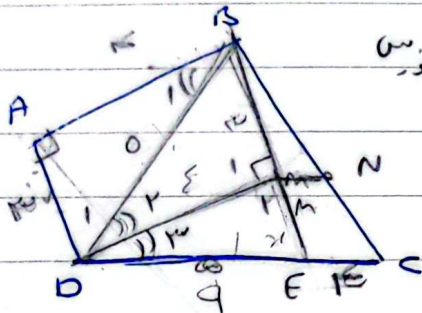


سأثبت أن $DE \parallel BC$ و $DE = \frac{1}{2} BC$



$$\frac{S_{BCE}}{S_{ADE}} = \frac{\frac{1}{2} \sin \hat{B} \times BE \times BC}{\frac{1}{2} \sin \hat{E} \times BE \times DE} = \frac{BC}{DE} = \frac{12}{6} = 2$$

$DE \parallel BC, \hat{B} = \hat{E}$
 $\triangle ADE \sim \triangle ABC$ $\frac{DE}{BC} = \frac{6}{12} \rightarrow DE = \frac{1}{2} BC$



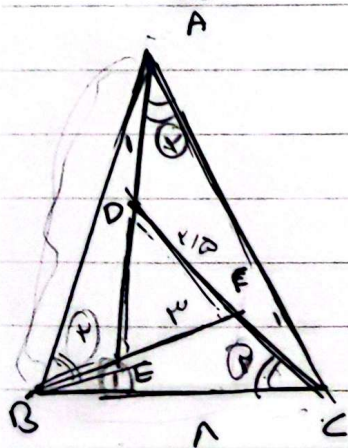
$\hat{B} = \hat{D}$ $\hat{C} = \hat{E}$ $\hat{A} = \hat{A}$

$\hat{B} = \hat{D}$ $\hat{C} = \hat{E}$ $\hat{A} = \hat{A}$
 $\triangle BDP \cong \triangle DEM$
 $BD = DE$

$\hat{D} = \hat{E}$ $\hat{B} = \hat{D}$ $\hat{C} = \hat{E}$
 $\triangle BDP \cong \triangle DEM$
 $BD = DE$

$DE + EC = 9 \rightarrow EC = 6$

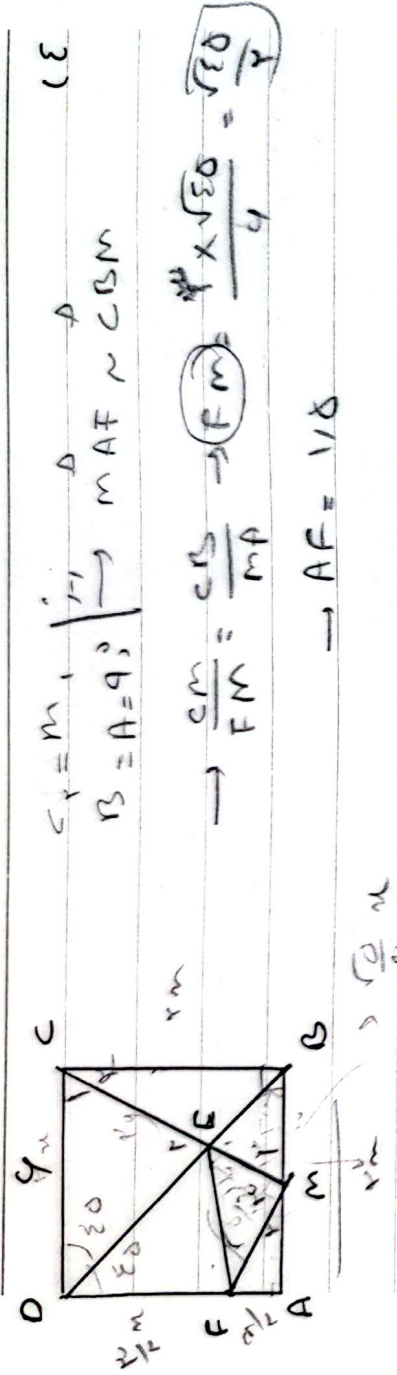
$BN = NC$ $BM = ME$ $\rightarrow \triangle BNM \sim \triangle CNE \rightarrow \frac{MN}{EC} = \frac{1}{2} \rightarrow MN = \frac{6}{2} = 3$



$\hat{E} = \hat{A} + \hat{B}$ $\hat{D} = \hat{E} + \hat{A}$ $\hat{F} = \hat{B} + \hat{C}$

$\hat{E} = \hat{A} + \hat{A} = \hat{A}$ $\hat{D} = \hat{C} + \hat{C} = \hat{C}$ $\hat{F} = \hat{B} + \hat{B} = \hat{B}$

$\frac{AB}{EF} = \frac{BC}{FD} \rightarrow AB = \frac{12 \times 6}{6} = 12$

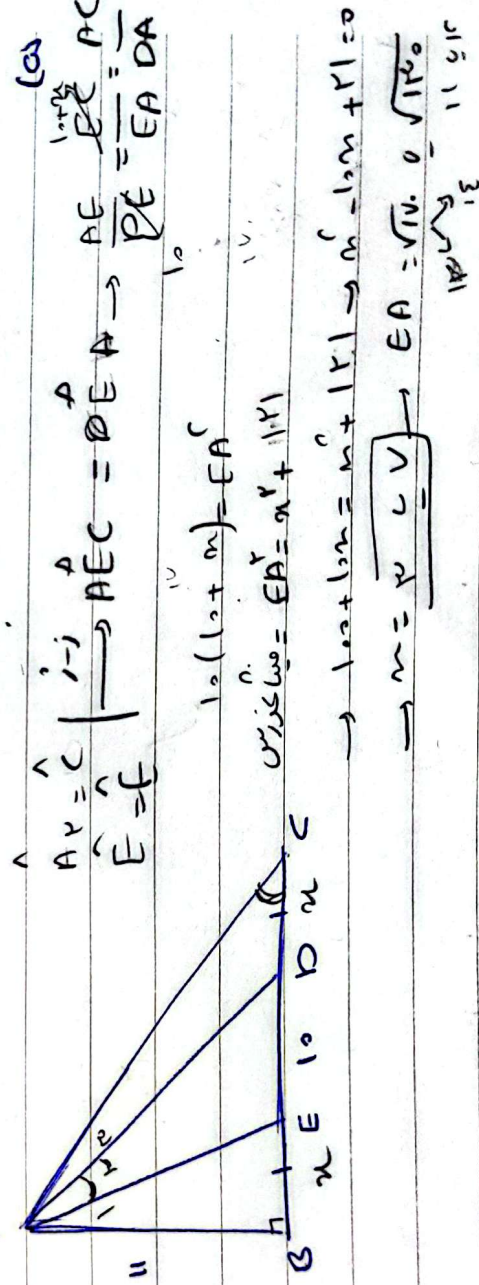


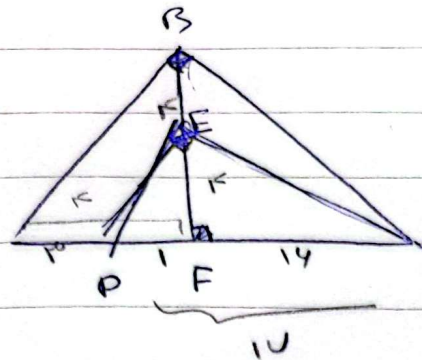
$$MC = \sqrt{9 + 4} = \sqrt{13}$$

$$\begin{aligned} \hat{E}_1 = E_2 & \mid \hat{i} \mid \rightarrow EM \sim EC \rightarrow \frac{MB}{CD} = \frac{EM}{EC} = \frac{1}{4} \\ \hat{E}_1 = M_1 & \rightarrow EM = \frac{EC}{4} = \frac{\sqrt{10}}{4} \end{aligned}$$

$$m_1 + m_2 = 90^\circ \rightarrow m_2 = 90^\circ - \sin 90^\circ = 1$$

$$S \sim FE = \frac{1}{4} \sin 90^\circ \times MF \times ME = \frac{1}{4} \times 1 \times \frac{\sqrt{10}}{4} \times \sqrt{10} = \left[\frac{10}{16} \right]$$





$BC = ?$

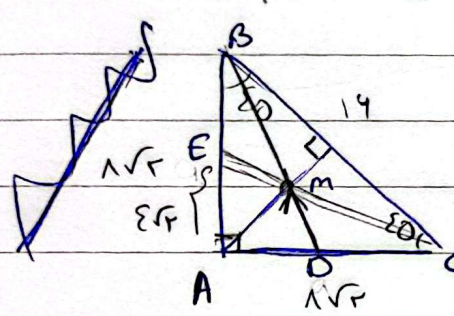
$EF^2 = DF \times FC \rightarrow FC = \frac{14}{1} = 14$

$BE^2 = AE \times CF \rightarrow BE = \sqrt{14 \times 8} = 11$

$BC = 14$

$BC^2 = CF \times CA \rightarrow BC = \sqrt{14 \times 20} = 11.5$

چون میان خط عمود است پس خط قائم الزامی است دایره بزرگ تر

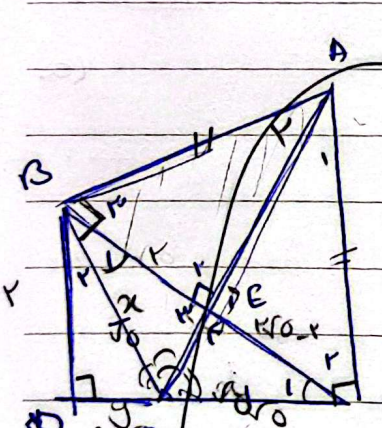


$AE^2 = 14 \rightarrow AE = 11.5$

$CE^2 = AE^2 + AC^2 \rightarrow CE = \sqrt{14 + 128}$

$CE = \sqrt{140} = 11.8$

$CE - BE = 11.8 - 8 = 3.8$



$OC = OB$ و $OC \perp AC$ چون $OC \perp AC$ پس AO نیمه زار A است پس $\hat{A}_1 = \hat{A}_2$

$\hat{A}_1 = \hat{A}_2$ پس $ABO \cong ACO$ (دو)

$AB = AC$

$BC = \sqrt{14 + 19} = 5.5$

$E = P = Q$

$B_1 = B_2$

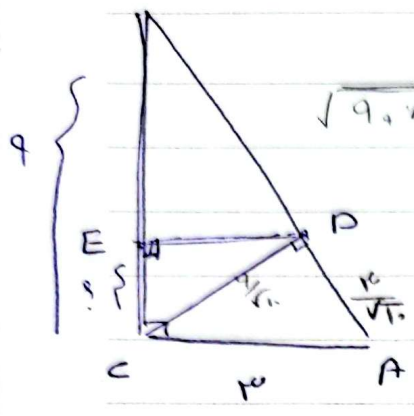
$B_1 = C_1$

$BCP \sim BOP$

$\frac{CD}{BP} = \frac{BC}{BO} \rightarrow \frac{1}{2} = \frac{5.5}{BO} \rightarrow BO = 11$

$\frac{5.5}{11} = \frac{1}{2}$

1 1



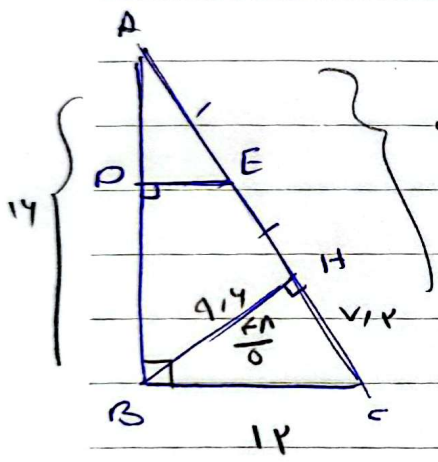
$$\sqrt{9 \cdot 11} = \sqrt{90} = 3\sqrt{10} = BA$$

$$S_{ABC} = \frac{1}{2} AB \times CD = \frac{1}{2} AC \times BC \rightarrow$$

$$CD = \frac{10 \times 9}{3\sqrt{10}} = \frac{9}{\sqrt{10}}$$

$$\text{Ow. n. } AD = \sqrt{9 - \frac{1}{10}} = \sqrt{\frac{9}{10}} = \frac{3}{\sqrt{10}}$$

$$\text{Ow. n. } \frac{DA}{BA} = \frac{EC}{BC} \rightarrow \frac{\frac{3}{\sqrt{10}}}{3\sqrt{10}} = \frac{EC}{9} \rightarrow EC = \frac{10 \times 9}{\sqrt{10} \times \sqrt{10}} = \frac{9}{1}$$



$$AC = \sqrt{14^2 + 12^2} = \sqrt{100} = 10$$

(1)

$$S_{ABC} = \frac{1}{2} AC \times BH = AB \times BC$$

$$BH = \frac{14 \times 12}{10} = \frac{168}{10} = \frac{84}{5}$$

$$CH = \sqrt{14^2 - \left(\frac{84}{5}\right)^2} = \sqrt{100 - \frac{7056}{25}} = \sqrt{\frac{2500 - 7056}{25}} = \sqrt{\frac{-4556}{25}} = \frac{\sqrt{4556}}{5}$$

$$AH + BH = 14 \rightarrow AH = 14 - \frac{84}{5} = \frac{70 - 84}{5} = -\frac{14}{5}$$

$$ADE \sim ABC \text{ (DE} \parallel BC) \rightarrow \frac{DE}{BC} = \frac{AE}{AC} \rightarrow DE = \frac{9/4 \times 12}{10} = \frac{27}{10}$$