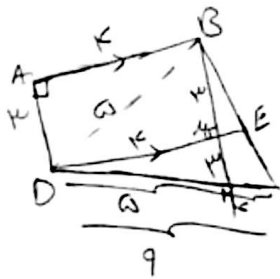


$$\frac{S_{BCE}}{S_{BDE}} = \frac{\frac{1}{2} \times BE \times BC \times \sin \hat{B}_1}{\frac{1}{2} \times BE \times DE \times \sin \hat{E}_1} = \frac{BC}{DE} = \frac{12}{9}$$

$$DE \parallel BC \Rightarrow \frac{\hat{D}E\hat{B}}{\hat{E}_1} = \frac{\hat{E}B\hat{C}}{\hat{B}_1} \text{ و } \frac{AD}{AB} = \frac{DE}{BC} = \frac{9}{12}$$



ABMD = مستطیل

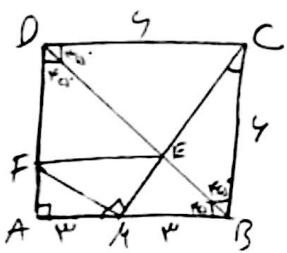
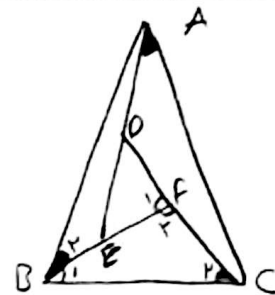
$$BMD \cong MDH \rightarrow BM = MH = 3$$

عمود منصفه بیانه ۵ نیمساز ۵ ارتفاع ۱۰ در مثلث متساوی الساقین $ME = \frac{MD}{2} = 2$ طبق خواص نیمساز

$$\triangle ABC \sim \triangle DEF \rightarrow \frac{AB}{3} = \frac{1}{2} \times 6 \rightarrow AB = 9,4$$

$$\hat{F}_1 = \hat{B}_1 + \hat{C}_1 \Rightarrow \hat{F}_1 = \hat{B}_2$$

ب دلیل متساوی
برای زوایای دیگر اینها
متساوی هستند



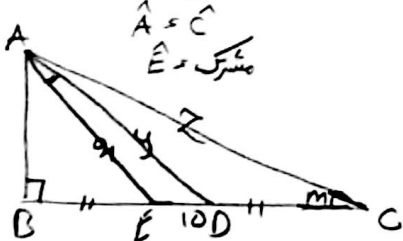
$$CM = \sqrt{6^2 + 3^2} = 3\sqrt{5}, \quad \left. \begin{matrix} \hat{C} = \hat{M} \\ \hat{B} \text{ و } \hat{A} \text{ و } 90^\circ \end{matrix} \right\} \rightarrow \triangle MAF \sim \triangle CBM \rightarrow \frac{CB}{AM} = \frac{CM}{FM}$$

$$FM = \frac{2 \times 3\sqrt{5}}{4} = \frac{3\sqrt{5}}{2}$$

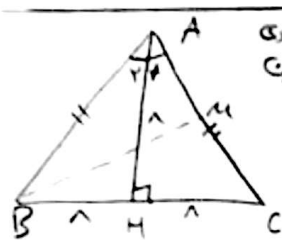
$$\text{در نهایت: } \frac{1}{2} \times \sqrt{5} \times \frac{3\sqrt{5}}{2} = \frac{15}{2}$$

$$\left. \begin{matrix} DC \parallel AB \\ CM = 3 \end{matrix} \right\} \rightarrow \hat{D} = \hat{B} \quad \left. \begin{matrix} \hat{E}_1 = \hat{E}_2 \end{matrix} \right\} \rightarrow \triangle CED \sim \triangle BEM \rightarrow \frac{CD}{BM} = \frac{CE}{EM} \xrightarrow{\text{ترکیب دو صورت}} \frac{CD + BM}{BM} = \frac{CE + EM}{EM} \rightarrow \frac{9}{3} = \frac{3\sqrt{5}}{ME \rightarrow \sqrt{5}}$$

$$\triangle AED \sim \triangle AEC \rightarrow \frac{10}{21} = \frac{4}{2} = \frac{9}{10+m} \rightarrow 21 = 10(10+m) \rightarrow m^2 - 10m + 21 = 0 \rightarrow m = 3, 7$$



$$\begin{aligned} EF^2 &= DF \times FC \rightarrow FC = \frac{14}{1} = 14 \\ BF^2 &= AF \times FC \rightarrow BF = 1 \end{aligned} \left. \vphantom{\begin{aligned} EF^2 &= DF \times FC \\ BF^2 &= AF \times FC \end{aligned}} \right\} \rightarrow BC = \sqrt{1^2 + 14^2} = 1\sqrt{15}$$



نیم ساق = ارتفاع = ساقان
الساقین

$$AB = AC = \sqrt{AH^2 + HC^2} = 1\sqrt{17} \rightarrow CM = AM = 1\sqrt{17}$$

$$AH = HC \text{ و } \angle AHC = 90^\circ \Rightarrow \triangle AHC \text{ متساوی الساقین قائم الزاویه است} \rightarrow \begin{cases} \hat{A}_1 = \hat{C} = 45^\circ \\ \hat{C} = \hat{B} \end{cases} \Rightarrow A = 90^\circ$$

$$BM = \sqrt{AB^2 + AM^2} = \sqrt{170} = 1\sqrt{10}$$

$$\begin{aligned} \hat{E}_1 = \hat{E}_r \\ BO = OC \\ EO = \text{مركز} \end{aligned} \left. \vphantom{\begin{aligned} \hat{E}_1 = \hat{E}_r \\ BO = OC \\ EO = \text{مركز} \end{aligned}} \right\} \rightarrow BEC \cong CEO \rightarrow EC = EB$$

$$CB = \sqrt{1^2 + 14^2} = 1\sqrt{15} \rightarrow EC = EB = \sqrt{15}$$

$$\frac{1}{\sqrt{15}} = \frac{1}{AE} = \frac{1\sqrt{15}}{15} \rightarrow AE = 1\sqrt{15} \rightarrow S_{ABE} = \frac{1\sqrt{15} \times \sqrt{15}}{1} = 15$$

$$\begin{aligned} \frac{AC \times CB}{12} = CD \times AB \\ \frac{CA^2}{9} = AD \times AB \end{aligned} \left. \vphantom{\begin{aligned} \frac{AC \times CB}{12} = CD \times AB \\ \frac{CA^2}{9} = AD \times AB \end{aligned}} \right\} \rightarrow \begin{aligned} CD \times AB &= 3 \times AD \times AB \\ \Rightarrow AD + \frac{DC}{9AD} &= \frac{AC}{9} \end{aligned}$$

$$CD \times AB = 12 \rightarrow AB = \frac{12}{\frac{9\sqrt{10}}{10}} = 3\sqrt{10} \Rightarrow BD = AB - AD = \frac{12\sqrt{10}}{10} - \frac{3\sqrt{10}}{10} = \frac{9\sqrt{10}}{10}$$

$$\frac{CD \times DB}{\frac{9\sqrt{10}}{10}} = DE \times BC \Rightarrow DE = \frac{12}{10} = 1.2 \quad \& \quad BE = \sqrt{\left(\frac{9\sqrt{10}}{10}\right)^2 - \left(\frac{12}{10}\right)^2} = 1.1$$

$$AC = \sqrt{14^2 + 12^2} = 20, \quad \frac{AB \times BC}{14} = \frac{BH \times AC}{20} \Rightarrow BH = 9.4$$

$$AH = \sqrt{14^2 - (9.4)^2} = 11.1 \Rightarrow AE = 9.4$$

$$\begin{aligned} DE \perp AB \\ CB \perp AB \end{aligned} \left. \vphantom{\begin{aligned} DE \perp AB \\ CB \perp AB \end{aligned}} \right\} \rightarrow DE \parallel BC \rightarrow \frac{DE}{BC} = \frac{AE}{AC} \rightarrow DE = \frac{14 \times 9.4}{20} = 11.14$$