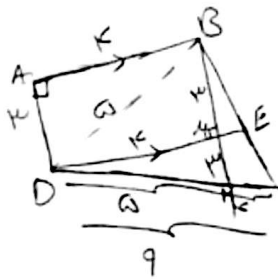


$$\frac{S_{BCE}}{S_{BDE}} = \frac{\frac{1}{2} \times BE \times BC \times \sin \hat{B}_1}{\frac{1}{2} \times BE \times DE \times \sin \hat{E}_1} = \frac{BC}{DE} = \frac{12}{9}$$

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



ABMD = مستطیل

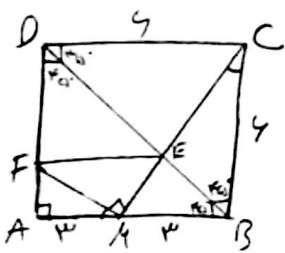
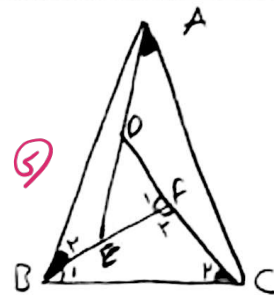
$$\triangle BMD \cong \triangle MDH \rightarrow BM = MH = 3$$

عمود منصفه بیانه به نیمساز و ارتفاع و در مثل متساوی الساقین $ME = \frac{MD}{2} = 2$
طبق خواص نیمساز

$$\triangle ABC \sim \triangle DEF \rightarrow \frac{AB}{3} = \frac{1}{2} \times 9 \rightarrow AB = 9.4$$

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

به دلیل متساوی
برای تطبیق دیگر اینها
متساوی باشند



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

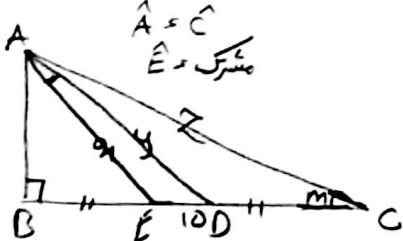
$$FM = \frac{2 \times 3\sqrt{5}}{4} = \frac{3\sqrt{5}}{2}$$

$$\text{در نهایت: } \frac{1}{2} \times \sqrt{5} \times \frac{3\sqrt{5}}{2} = \frac{15}{4}$$

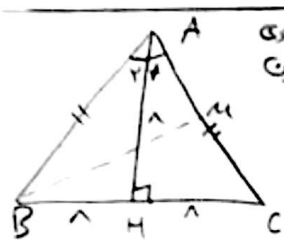
$$\left. \begin{array}{l} DC \parallel AB \\ CM = 3 \end{array} \right\} \rightarrow \hat{D} = \hat{B} \quad \left. \begin{array}{l} \hat{E}_1 = \hat{E}_2 \end{array} \right\} \rightarrow \triangle CEO \sim \triangle BEM \rightarrow \frac{CO}{BM} = \frac{CE}{ME} \xrightarrow{\text{ترکیب دو صورت}} \frac{CO + BM}{BM} = \frac{CE + EM}{EM}$$

$$\frac{9}{3} = \frac{3\sqrt{5}}{ME \rightarrow \sqrt{5}}$$

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



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



تيم يار = ارتفاع = ارتفاع الساقين

$$AB = AC = \sqrt{AH^2 + HC^2} = 1\sqrt{17} \rightarrow CH = AM = 4\sqrt{17}$$

$$AH = HC \text{ و } \angle AHC = 90^\circ \Rightarrow \triangle AHC \text{ متساوي الساقين قائم الزاوية } \Rightarrow \begin{cases} \hat{A}_1 = \hat{C} = 45^\circ \\ \hat{C} = \hat{B} \end{cases} \Rightarrow A = 90^\circ$$

$$BM = \sqrt{AB^2 + AM^2} = \sqrt{140} = 4\sqrt{10}$$

$$\begin{aligned} \hat{A}_1 = \hat{E}_1 \\ BO = OC \\ EO = \text{مركز} \end{aligned} \rightarrow BEC \cong CEO \rightarrow EC = EB$$

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

$$\frac{1}{\sqrt{15}} = \frac{1}{AE} = \frac{1\sqrt{15}}{15} \rightarrow AE = 1\sqrt{15} \rightarrow S_{ABE} = \frac{1\sqrt{15} \times \sqrt{15}}{2} = 15$$

$$\begin{aligned} \frac{AC \times CB}{2} &= CD \times AB \\ \frac{CA^2}{9} &= AD \times AB \end{aligned} \rightarrow \begin{cases} CD \times AB = 3 \times AD \times AB \\ CD = 3AD \end{cases} \Rightarrow \frac{AD^2 + DC^2}{9AD^2} = \frac{AC^2}{9} \rightarrow \begin{cases} AD = \frac{3\sqrt{10}}{10} \\ DC = \frac{9\sqrt{10}}{10} \end{cases}$$

$$CD \times AB = 2\sqrt{15} \rightarrow AB = \frac{2\sqrt{15}}{\frac{9\sqrt{10}}{10}} = 3\sqrt{10} \Rightarrow BD = AB - AD = \frac{1\sqrt{15}}{10}$$

$$\frac{CD \times DB}{9} = DE \times BE \Rightarrow DE = \frac{1\sqrt{15}}{10} = 1\sqrt{15} \Rightarrow BE = \sqrt{\left(\frac{1\sqrt{15}}{10}\right)^2 + \left(\frac{1\sqrt{15}}{10}\right)^2} = 1,1$$

$$AC = \sqrt{14^2 + 12^2} = 20, AB \times BC = BH \times AC \Rightarrow BH = 9,6$$

$$AH = \sqrt{14^2 - (9,6)^2} = 11,1 \Rightarrow AE = 9,4$$

$$\begin{aligned} DE \perp AB \\ CB \perp AB \end{aligned} \rightarrow DE \parallel BC \rightarrow \frac{DE}{BC} = \frac{AE}{AC} \rightarrow DE = \frac{12 \times 9,4}{20} = 11,16$$