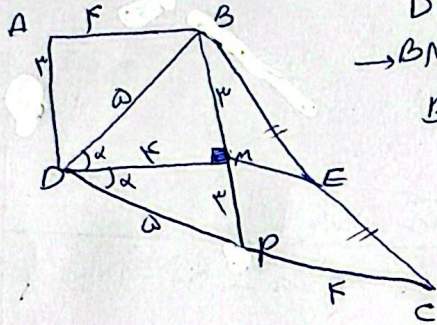
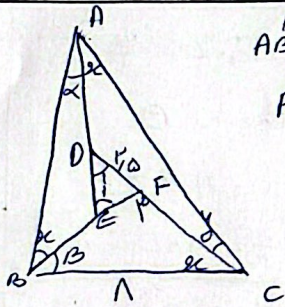




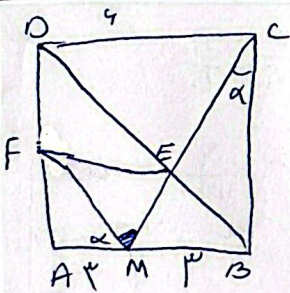
$$\begin{aligned}
 DE \parallel BC &\rightarrow \triangle ADE \sim \triangle ABC \rightarrow \frac{S_{ADE}}{S_{ABC}} = \left(\frac{AD}{AB}\right)^2 = \left(\frac{1}{2}\right)^2 = \frac{1}{4} \rightarrow S_{ABC} = \frac{4}{1} S_{ADE} \\
 S_{ADE} = x &\rightarrow S_{ABC} = \frac{4}{1} x \\
 BDE, ADE \text{ (ارتفاع مشترک)} &\rightarrow EH \leftarrow \frac{S_{ADE}}{S_{BDE}} = \frac{\frac{1}{2} \times EH \times \omega}{\frac{1}{2} \times EH \times V} = \frac{\omega}{V} \rightarrow \frac{x}{S_{BDE}} = \frac{\omega}{V} \rightarrow S_{BDE} = \frac{V}{\omega} x \\
 S_{BCE} = S_{ABC} - S_{ADE} - S_{BDE} &= \frac{4}{1} x - x - \frac{V}{\omega} x = \frac{3x}{\omega} \\
 S_{BCE} = \frac{3x}{\omega} &\quad \frac{S_{BCE}}{S_{BDE}} = \frac{\frac{3x}{\omega}}{\frac{V}{\omega} x} = \frac{3}{V} = \frac{3}{4}
 \end{aligned}$$



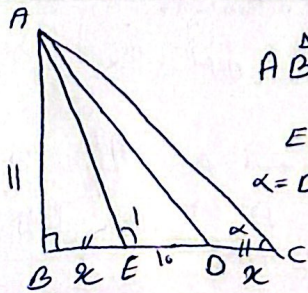
$$\begin{aligned}
 DM \parallel AB \text{ و } BM \parallel AD &\rightarrow \text{مستطیل } ABMD \rightarrow AD = 2, AB = 4 \\
 \rightarrow BM = 2, DM = 2 &\rightarrow \sqrt{2^2 + 2^2} = \omega = BD \\
 \triangle BDC = 2, \triangle BDM &\rightarrow \triangle BDM = \triangle DMP = x \\
 MD \text{ (ارتفاع مشترک)} &\rightarrow \triangle BDP \rightarrow DM = 2 \\
 \rightarrow BM = MP = 2 &\rightarrow \triangle BPC \rightarrow E, M \rightarrow ME \parallel PC \rightarrow ME = \frac{1}{2} PC = \frac{1}{2} \times 4 = 2
 \end{aligned}$$



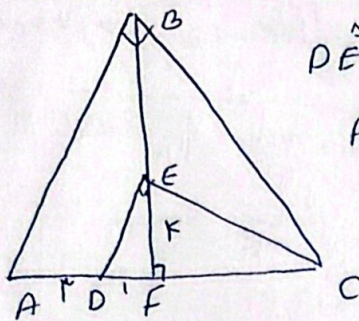
$$\begin{aligned}
 \triangle ABE &\rightarrow \hat{E}_1 = x + x = \hat{A} \\
 \triangle ADC &\rightarrow \hat{D}_1 = x + y = \hat{C} \\
 \} &\rightarrow \triangle ABC \sim \triangle DEF \\
 \frac{DF}{BC} = \frac{EF}{AB} &\rightarrow \frac{2}{4} = \frac{2}{AB} = \frac{1}{2} \\
 \rightarrow AB = \frac{2 \times 2}{1} = 4
 \end{aligned}$$



$$\begin{aligned}
 AM = BM = 2 &\rightarrow \text{مربع } BME \rightarrow \triangle BME \sim \triangle DEC \\
 \rightarrow \frac{ME}{CE} = \frac{BM}{DC} = \frac{2}{4} = \frac{1}{2} &\quad \triangle BCM : CM^2 = BC^2 + BM^2 = 4^2 + 2^2 = 20 \\
 CM = 2\sqrt{5} &\quad ME = \sqrt{5}, CE = 2\sqrt{5} \\
 \triangle BCM \rightarrow \alpha \text{ مشترک} &\rightarrow \triangle BCM \sim \triangle MCF \rightarrow \frac{AM}{BC} = \frac{MF}{MC} \Rightarrow \\
 \hat{B} = \hat{A} = 90^\circ &\quad \frac{2}{4} = \frac{MF}{2\sqrt{5}} \rightarrow MF = \sqrt{5} \\
 S_{MEF} = \frac{1}{2} \times \sqrt{5} \times \frac{1}{2} \sqrt{5} = \frac{5}{4} = 1.25
 \end{aligned}$$



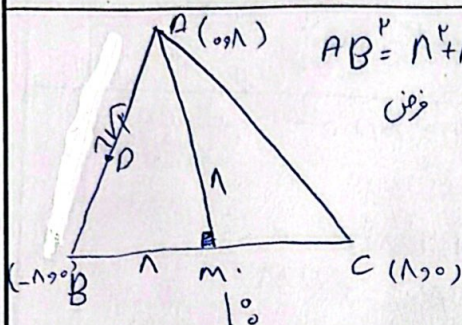
$$\begin{aligned}
 \triangle ABE : AE^2 &= AB^2 + BE^2 = 12^2 + x^2 \rightarrow AE = \sqrt{144 + x^2} \\
 EI = EI \text{ (ارتفاع مشترک)} &\rightarrow \triangle AEC \sim \triangle AED \rightarrow \frac{AE}{ED} = \frac{EC}{AE} \rightarrow AE^2 = ED \times EC \\
 \alpha = \hat{DAE} = \hat{ACD} &\rightarrow 12 + x^2 = 12(1 + x) \rightarrow x^2 - 12x + 12 = 0 \rightarrow x = 6
 \end{aligned}$$



$$D \hat{E} C : EF^2 = DF \times FC \rightarrow F^2 = 14 \times FC \rightarrow FC = 14$$

$$A \hat{B} C : BF^2 = AF \times FC = F \times 14 = 4F \rightarrow BF = 2$$

$$B \hat{F} C : BC^2 = BF^2 + FC^2 \rightarrow BC^2 = 4 + 14 = 18 \Rightarrow BC = 3\sqrt{2}$$

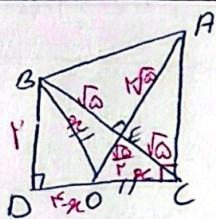


$$AB^2 = AM^2 + MB^2 \rightarrow AB = AM$$

$$D \rightarrow B(-1, 0) \quad C(1, 0) \quad A(0, 1) \quad M(0, 0.5) \rightarrow AM = 1 \rightarrow A(0, 1)$$

$$D \rightarrow \frac{1}{2} \rightarrow \left(\frac{0 + (-1)}{2}, \frac{1 + 0}{2} \right) = \left(-\frac{1}{2}, \frac{1}{2} \right)$$

$$CD \perp AD \rightarrow CD = \sqrt{(1 - (-\frac{1}{2}))^2 + (0 - \frac{1}{2})^2} = \sqrt{1 + \frac{1}{4}} = \sqrt{\frac{5}{4}} = \frac{\sqrt{5}}{2}$$



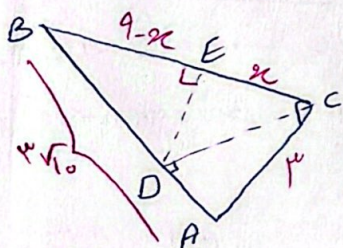
$$BD^2 + OD^2 = BO^2 \rightarrow 1^2 + (F-x)^2 = x^2 \rightarrow 1 + 14 - 14x + x^2 = x^2 \rightarrow 15 = 14x \rightarrow x = \frac{15}{14}$$

$$BC^2 = BD^2 + DC^2 \rightarrow BC^2 = 1 + 14 = 15 \rightarrow BC = \sqrt{15} \rightarrow EC = \frac{BC}{2} = \frac{\sqrt{15}}{2}$$

$$O \hat{E} C : OC^2 = EC^2 + EO^2 \rightarrow (15/14)^2 = (\sqrt{15}/2)^2 + EO^2 \rightarrow EO = \frac{\sqrt{15}}{2}$$

$$\rightarrow 1/2 \times \sqrt{15} = \sqrt{15}/2 \rightarrow EO = \frac{\sqrt{15}}{2} \quad A \hat{O} C : EC^2 = AE \times EO$$

$$S_{ABE} = \frac{1}{2} \times AE \times BE = \frac{1}{2} \times \sqrt{15} \times \sqrt{15} = \frac{15}{2} \quad (\sqrt{15})^2 = AE \times \frac{\sqrt{15}}{2} \rightarrow AE = 2\sqrt{15}$$

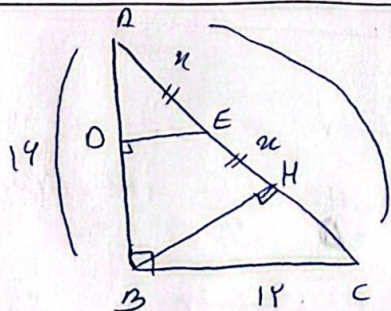


$$A \hat{B} C : AB^2 = AC^2 + BC^2 \rightarrow AB^2 = 9 + 16 = 25 \rightarrow AB = 5$$

$$AB = \sqrt{25} = 5$$

$$A \hat{C}^2 = AD \times AB \rightarrow 9 = AD \times 5 \rightarrow AD = \frac{9}{5} = \frac{3\sqrt{10}}{5}$$

$$\frac{AD}{AB} = \frac{EC}{BC} \rightarrow \frac{\frac{3\sqrt{10}}{5}}{5} = \frac{x}{5} \rightarrow x = \frac{3}{5} \rightarrow BE = 9 \rightarrow AE = 1/1$$



$$AC = \sqrt{(14)^2 + (11)^2} = \sqrt{305} = 17$$

$$B \hat{H} \times AC = AB \times BC \rightarrow BH = \frac{17 \times 14}{17} = 14$$

$$\rightarrow AH = \sqrt{14^2 - 9^2} = 11 \rightarrow AE = \frac{AH}{2} = \frac{11}{2}$$

$$\rightarrow A \hat{D} E \sim A \hat{B} H \rightarrow \frac{DE}{BH} = \frac{AE}{AB} \rightarrow DE = \frac{11}{17} \times 14 = \frac{154}{17}$$