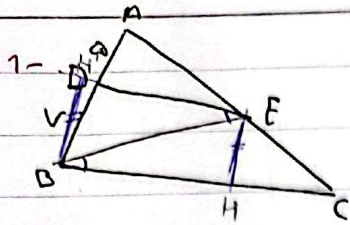


(فردی)

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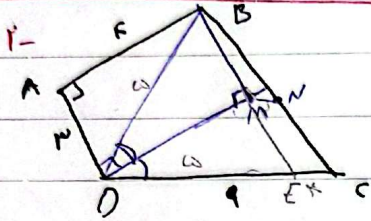


$$\frac{DE}{BC} = \frac{AD}{AB} = \frac{AE}{AC} = \frac{\alpha}{11}$$

$$EH = DH'$$

$$\left[\frac{S_{BCE}}{S_{ADE}} = \frac{\frac{1}{2} \times BC \times EH}{\frac{1}{2} \times DE \times BH} = \frac{BC}{DE} = \frac{11}{\alpha} \right]$$

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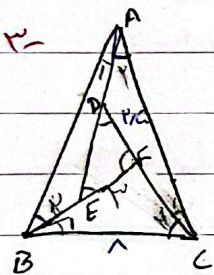
$$\hat{A}BD \sim \hat{A}CE \Rightarrow DB^2 = \alpha^2 + \alpha^2 \Rightarrow BD = \alpha$$

$$\left. \begin{array}{l} \hat{D}M = \hat{D}N \\ \hat{B}DM \sim \hat{D}NE \\ \hat{M}_1, \hat{N}_1 = 90^\circ \end{array} \right\} \Rightarrow \hat{B}DM \cong \hat{D}NE \Rightarrow \hat{D}EA = \hat{D}B \Rightarrow EC = \alpha$$

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$$\left. \begin{array}{l} M \rightarrow BE \perp \\ N \rightarrow BC \perp \end{array} \right\} \Rightarrow MN \parallel EC \Rightarrow \frac{BM}{BE} = \frac{MN}{EC} \Rightarrow \frac{1}{2} = \frac{NN}{K} \Rightarrow NN = 1$$

$$KBM = BE$$

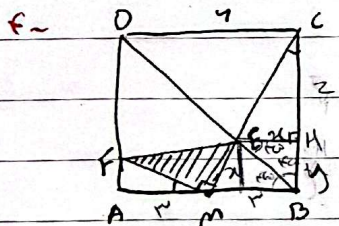


$$\begin{aligned} \hat{F} &= \hat{B}_1 + \hat{C}_1 = \hat{B}_1 + \hat{B}_2 = \hat{B} \\ \hat{E} &= \hat{A}_1 + \hat{B}_2 = \hat{A}_1 + \hat{A}_2 = \hat{A} \\ \hat{D} &= \hat{C}_1 + \hat{A}_2 = \hat{C}_1 + \hat{C}_2 = \hat{C} \end{aligned}$$

$$\Rightarrow \frac{DE}{AC} = \frac{FE}{AB} = \frac{DF}{BC}$$

$$\frac{DE}{AC} = \frac{1}{AB} = \frac{10}{11} \Rightarrow AB = 9,1$$

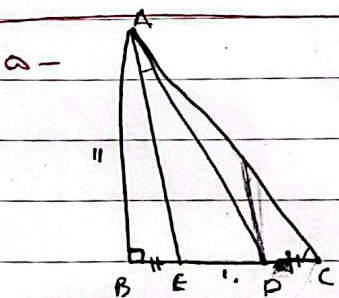
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$$\hat{M}CB = \hat{F}MA, \hat{A} = \hat{B} = 90^\circ \Rightarrow \frac{CB}{AM} = \frac{FM}{AE} = \frac{CM}{FM}$$

$$\Rightarrow \frac{4}{11} = \frac{11}{AF} = \frac{\sqrt{17}}{FM} \Rightarrow AF = 1,2, FM = \frac{\sqrt{17}}{11}$$

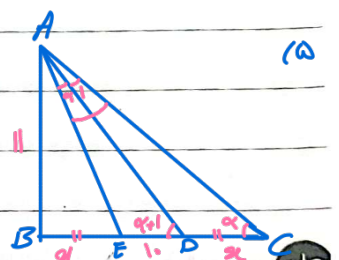
$$\frac{4}{11}$$



V, w

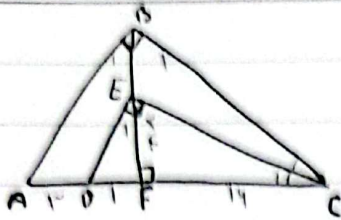
$$\hat{CAE} \sim \hat{AED} \Rightarrow \left. \begin{array}{l} \alpha = \alpha \\ \alpha + 1 = \alpha + 1 \\ \hat{E} = \hat{E} \end{array} \right\} \rightarrow \frac{AE}{ED} = \frac{EC}{AE}$$

$$\frac{\sqrt{\alpha^2 + 11}}{1} = \frac{\alpha + 1}{\sqrt{\alpha^2 + 11}} \Rightarrow \alpha = 10 \leq V$$



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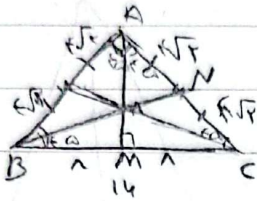
4-



$$\begin{aligned} \hat{C} &= 90^\circ \\ \hat{C}_1 &= 90^\circ - \hat{C}_2 \quad \left\{ \begin{array}{l} \hat{C}_1 = \hat{E}_1 \\ \hat{C}_2 = \hat{F}_2 \end{array} \right\} \Rightarrow \frac{EC}{ED} = \frac{CF}{EF} \\ \hat{C} &= 90^\circ - \hat{B}_1 \\ \hat{B}_1 &= 90^\circ - \hat{B}_2 \quad \left\{ \begin{array}{l} \hat{C}_1 = \hat{E}_1 \\ \hat{C}_2 = \hat{F}_2 \end{array} \right\} \Rightarrow \frac{CF}{BF} = \frac{BC}{AB} = \frac{BF}{AF} \\ \frac{14}{BF} &= \frac{BC}{AB} = \frac{BF}{AF} \end{aligned}$$

$$\Rightarrow BF^2 = 4 \times 14 \Rightarrow BF = 2\sqrt{14} \Rightarrow BC = \sqrt{14^2 + 14^2} = \sqrt{196} = 14$$

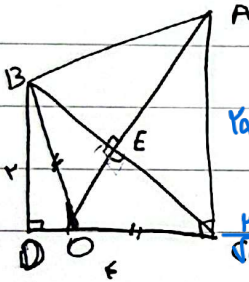
V-



$$AC = AB = 14\sqrt{2}$$

$$BN^2 = AN^2 + AB^2 = 4^2 + 14^2 = 196 \Rightarrow BN = 14\sqrt{2}$$

VI-



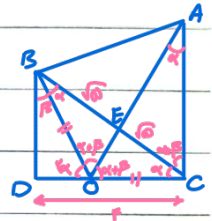
$$\frac{OC}{AC} = \frac{1}{2}$$

$$\angle A + \angle B = 90^\circ$$

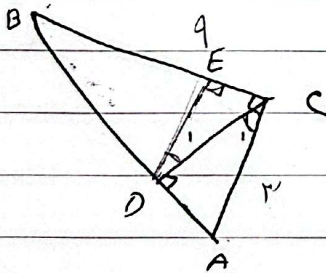
$$BD^2 + DC^2 = BC^2 \Rightarrow BC = 2\sqrt{2} \cdot BE = 2EC \Rightarrow BE = EC = \sqrt{2}$$

$$\frac{1}{\sqrt{2}} = \frac{AE}{\sqrt{2}} = \frac{14\sqrt{2}}{2} \Rightarrow AE = 14\sqrt{2}$$

$$S_{ABE} = \frac{1}{2} AE \times BE = 14$$



7-



$$ED \parallel AC, DC \parallel AB \Rightarrow \hat{D}_1 = \hat{C}, \hat{D}_2 = \hat{E} = 90^\circ$$

$$\Rightarrow \frac{ED}{DC} = \frac{EC}{AD} = \frac{DC}{AC}$$

$$\frac{ED}{DC} = \frac{EC}{AD} = \frac{DC}{AC}$$

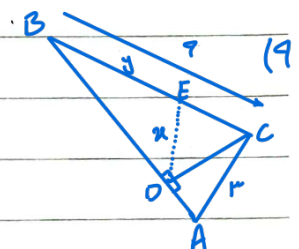
$$\frac{EC}{ED} = \frac{DE}{BE} = \frac{DC}{BD}$$

$$\frac{DE}{AC} = \frac{BE}{BC} = \frac{BD}{BA}$$

$$\frac{DE}{x} = \frac{BE}{9-x} = \frac{BD}{9} \Rightarrow DE = BE \quad \text{--- (1)}$$

$$\frac{x}{9} = \frac{y}{9} \Rightarrow y = 3x$$

$$x^2 = y(9-y) = 3x(9-3x) \Rightarrow x = 3, y = 6$$



$$MC^2 = 4^2 + 3^2 \rightarrow MC = 5$$

$$\tan K = \frac{3}{4} = \tan M = \frac{BC}{MB} = 1 \rightarrow AF = \frac{3}{1}$$

$$FM^2 = AF^2 + AM^2 \rightarrow MF = \frac{5\sqrt{2}}{2}$$

$$DEC, MEB \text{ (نسبت متساوی در مثلث)} = \frac{4}{3} = 1 \rightarrow 3y = 5\sqrt{2} \rightarrow y = \sqrt{2}$$

$$S_{FME} = \frac{1}{2} ME \times MF = \frac{15}{2}$$

$$AB^2 + BC^2 = AC^2 \rightarrow AC = 5$$

$$\triangle ADE \sim \triangle ABH \rightarrow \begin{cases} \hat{A} = \hat{A} \\ \hat{D} = \hat{H} = 90^\circ \end{cases} \rightarrow \frac{DE}{BH} = \frac{AE}{14} \quad (1)$$

$$S_{ABC} = \frac{AB \times BC}{2} = \frac{BH \times AC}{2} \rightarrow BH = 4,4$$

$$\triangle ABC \rightarrow 14^2 = AH \times 5 \rightarrow AH = 12,1 \rightarrow AE = \frac{AH}{2} = 6,05$$

$$(1) \rightarrow \frac{DE}{BH} = \frac{AE}{14} = \frac{DE}{4,4} = \frac{6,05}{14} \rightarrow DE = 3,85$$

