

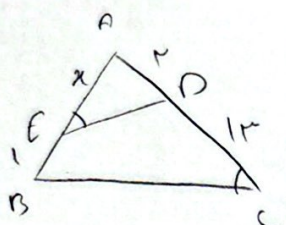
$$\left. \begin{matrix} \hat{C}_1 = \hat{A}_1 \\ \hat{F}_1 = \hat{F}_r \end{matrix} \right\} \xrightarrow{ii} \triangle BCF \sim \triangle ECF \rightarrow \frac{AE}{BC} = \frac{EF}{BF} = \frac{AF}{CF}$$

$$AC^2 = 9x^2 + 9x^2 = 18x^2 \quad AC = 3\sqrt{2}x \quad \frac{1}{\sqrt{2}}$$

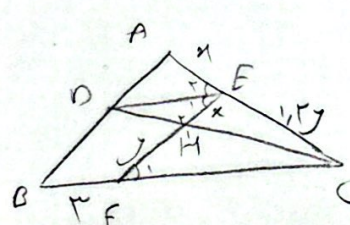
$$y = \sqrt{2}x \quad BE^2 = 9x^2 + 9x^2 = 18x^2 \quad BE = 3\sqrt{2}x \quad r_2 = \sqrt{2}x$$

$$\frac{EF}{AF} = \frac{2}{y} = \frac{\frac{\sqrt{2}x}{\sqrt{2}}}{\frac{3\sqrt{2}x}{\sqrt{2}}} = \frac{\sqrt{2}}{3\sqrt{2}} = \frac{\sqrt{2}}{3}$$

$$\left. \begin{matrix} \hat{A} = \hat{A} \\ \hat{C} = \hat{E} \end{matrix} \right\} \xrightarrow{ii} \triangle ADE \sim \triangle ABC \quad \frac{r}{n+1} = \frac{n}{1\sqrt{2}}$$



$$n^2 + n - r = 0 \quad (n+1)(n-r) = 0 \quad \begin{cases} n = r \checkmark \\ n = -1 \times \end{cases}$$



$$\left. \begin{matrix} \hat{H}_1 = \hat{H}_r \\ \hat{E}_1 = \hat{F}_1 \end{matrix} \right\} \xrightarrow{ii} \triangle DEH \sim \triangle FCH \quad \frac{DE}{FC} = \frac{x}{y} = \frac{r}{a}$$

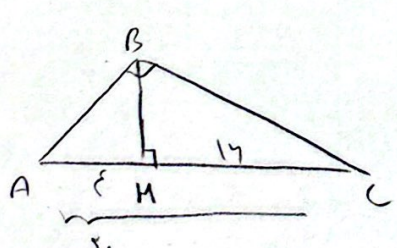
$$\left. \begin{matrix} \hat{A} = \hat{A} \\ \hat{E}_r = \hat{C} \end{matrix} \right\} \xrightarrow{ii} \triangle ADE \sim \triangle ABC \quad \frac{n}{n+1\sqrt{2}} = \frac{DE}{FC+r} = \frac{n}{r+\frac{a}{\sqrt{2}} \times \sqrt{2}x}$$

$$\frac{n}{r_n} = \frac{1}{r}$$

$$\frac{DE}{FC} = \frac{r}{a} \quad \frac{DE}{FC+r} = \frac{1}{r}$$

$$\frac{FC+r}{FC} = \frac{a}{r} \quad aFC + 1a = 9FC \quad rFC = 1a \quad FC = \frac{1a}{r}$$

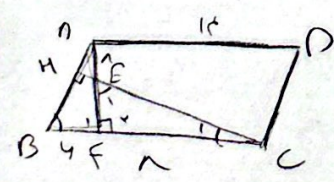
$$BC = \frac{14 \times 1a}{r} = \frac{14}{r}$$



$$AB^2 = AH \times AC = r \times r = a \quad AB = \sqrt{a}$$

$$AC^2 = 14 \times r \quad AC = 14\sqrt{a}$$

$$\frac{AC}{AB} = \frac{14\sqrt{a}}{\sqrt{a}} = 14$$

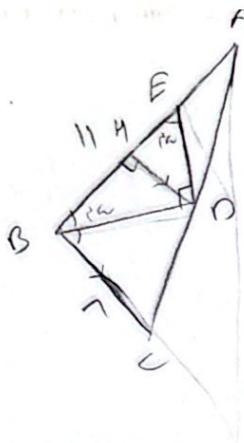


$$\left. \begin{matrix} \hat{C}_1 + \hat{E}_1 = 9 \\ \hat{C}_1 + \hat{B}_1 = 9 \end{matrix} \right\} \left. \begin{matrix} \hat{E}_1 = \hat{B} \\ \hat{F}_1 = \hat{F}_r = 9 \end{matrix} \right\} \xrightarrow{ii} \triangle FCE \sim \triangle ABF$$

$$\frac{1}{n+EF} = \frac{EF}{4} \quad EF^2 + nEF - 1a = 0$$

$$(EF+14)(EF-1) = 0 \quad \begin{cases} EF = 1 \checkmark \\ EF = -14 \times \end{cases}$$

$$AF = AE + EF = 14 + 1 = 15$$



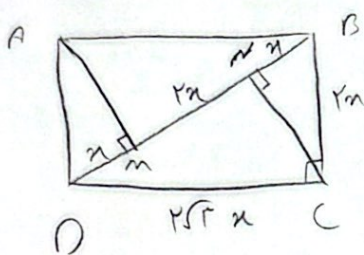
$$DH \parallel BC \xrightarrow{H:9} B=9 \rightarrow \hat{B}_1 = \hat{B}_2 = 120 \rightarrow \hat{E} = 120$$

$$EH = DH = \frac{11}{7} \quad \text{و نیز } DH \text{ عمود بر } BC \text{ است.} \rightarrow \text{مستطیل } BDE$$

$$\frac{AH}{AB} = \frac{DH}{BC} \rightarrow \frac{AE + 11}{11 + 7} = \frac{11}{14}$$

$$9 \cdot 11 + 11 \cdot 11 \cdot AE = 11 \cdot AE + 121 \quad 11 \cdot AE = 121$$

$$AE = 11$$

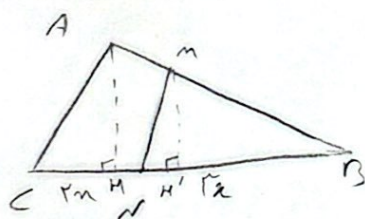


$$CM^2 = 12 \times 5 = 60 \quad CM = \sqrt{60}$$

$$BC^2 = 12 \times 5 \quad BC = 5$$

$$CD^2 = 144 - 60 = 84 \quad CD = \sqrt{84}$$

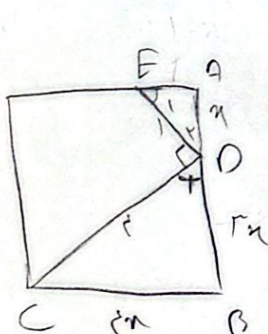
$$\frac{S_{ABCD}}{S_{BCM}} = \frac{12 \times 5 \sqrt{60}}{\frac{1}{2} \times \sqrt{60} \times 5} = 1$$



$$\frac{S_{BMC}}{S_{ABC}} = \frac{BM' \times \frac{1}{2} BC}{\frac{1}{2} AM \times BC} = \frac{1}{5}$$

$$\frac{BM'}{AM} = \frac{1}{5} \xrightarrow{BM' \parallel AM} \frac{BM}{AB} = \frac{BM'}{AM} = \frac{1}{5}$$

$$\xrightarrow{\text{تقاطع در } M} \frac{BM}{AB - BM} = \frac{1}{5} \Rightarrow \frac{BM}{AM} = \frac{1}{4}$$



$$\left. \begin{array}{l} \hat{D}_1 + \hat{E}_1 = 90 \\ \hat{D}_1 + \hat{D}_2 = 90 \end{array} \right\} \rightarrow \hat{E}_1 = \hat{D}_2 \quad \left. \begin{array}{l} \hat{A}_1 = \hat{B}_1 = 90 \end{array} \right\} \rightarrow \triangle ADE \sim \triangle BDC$$

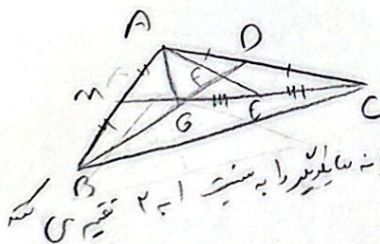
$$\frac{AD}{BC} = \frac{AE}{BD} = \frac{ED}{CD} = \frac{1}{5}$$

$$9 + 14 = 23$$

$$12 \times 12 = 144 \quad 12 = \frac{144}{12}$$

$$x = \frac{1}{5} \rightarrow \text{مربع } = \frac{1}{5}$$

$$S_{\triangle} = \frac{144}{12}$$



1- G محل تقاطع عمودهاست. پس BD و CM عمودند.

از طرفی در مثل AGC و GDE عمودند.

$$\frac{GD}{BD} = \frac{1}{5}$$

$$\frac{FD}{GD} = \frac{1}{5}$$

$$\frac{GD}{BD} \times \frac{FD}{GD} = \frac{FD}{BD} = \frac{1}{5} \rightarrow \frac{BD}{FD} = 5$$