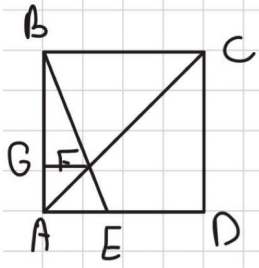


-۱



$$ED = 1 - \alpha$$

$$\alpha = AE \Rightarrow AD = 1 = \alpha + ED$$

از F خطی به سوازیات AD رسم تا AB را در G قطع کند $\Rightarrow AG = GF = \alpha$ قائم الزامه مستطیل

$$BG = 1 - \alpha$$

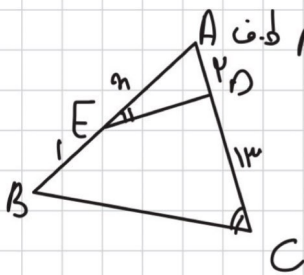
$$\triangle BGF \sim \triangle AEF \Rightarrow \frac{BG}{BA} = \frac{GF}{AE} \Rightarrow \frac{1-\alpha}{1} = \frac{\alpha}{\alpha} \Rightarrow \alpha = \frac{1}{2}$$

$$AF = AG \sqrt{2} = \frac{1}{\sqrt{2}}$$

$$AE - GF = \alpha - \frac{1}{2} = \frac{1}{2}$$

$$EF = \sqrt{\left(\frac{1}{2}\right)^2 + \left(\frac{1}{2}\right)^2} = \frac{1}{\sqrt{2}} \Rightarrow \frac{EF}{AF} = \frac{\frac{1}{\sqrt{2}}}{\frac{1}{\sqrt{2}}} = 1$$

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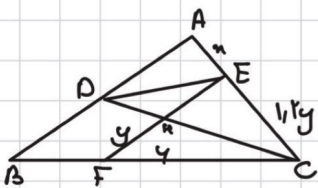


$$\triangle AED \sim \triangle ABC$$

$$\triangle AED \sim \triangle ABC \Rightarrow \frac{AE}{AC} = \frac{AD}{AB} = \frac{DE}{BC} \Rightarrow \frac{1}{1} = \frac{\alpha}{1} = \frac{1}{1} \Rightarrow \alpha = 1$$

$$1 + \alpha = 2 \Rightarrow \alpha = 1$$

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$$BF = 1, \alpha = 1 \Rightarrow \alpha = 1$$

$$DE = BC$$

$$DE = \frac{1}{2} FC$$

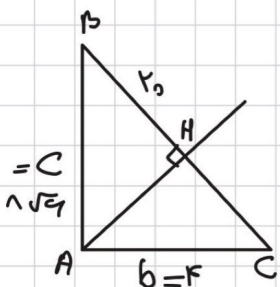
$$DE \parallel BC \Rightarrow \triangle ADE \sim \triangle ABC \Rightarrow \frac{AD}{AB} = \frac{AE}{AC} = \frac{DE}{BC} = \frac{1}{2} \Rightarrow \alpha = \frac{1}{2}$$

$$\triangle ADE \sim \triangle AFC \Rightarrow \frac{DE}{FC} = \frac{AE}{AC} = \frac{1}{2} \Rightarrow DE = \frac{1}{2} FC$$

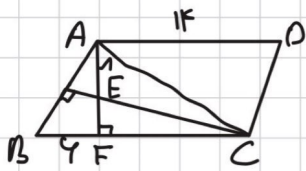
$$DE = BC \Rightarrow DE = FC + 1 \Rightarrow \frac{1}{2} FC - FC = 1$$

$$\frac{1}{2} FC = 1 \Rightarrow FC = 2 \Rightarrow BC = 2$$

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$$c^2 + b^2 = a^2 \Rightarrow c = \sqrt{a^2 - b^2} \Rightarrow \frac{1}{\sqrt{2}} = \sqrt{2}$$



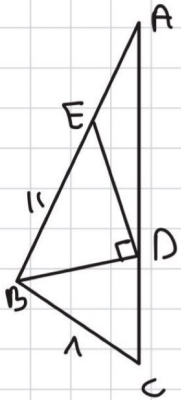
$$S = 14 \times AF$$

$$S_{\triangle ABC} = \frac{1}{2} \times AC \times h = FAC = S_{ABCD} = 14AC$$

$$\left. \begin{matrix} \hat{B} = \hat{B} \\ \hat{F} = \hat{A} = 90^\circ \end{matrix} \right\} \triangle AFC \sim \triangle ABC \Rightarrow \frac{AC}{BC} = \frac{AF}{AC} = \frac{14}{4} = \frac{7}{2}$$

$$BC = AD = 14 \Rightarrow AC = \frac{7}{2} \times 14 = \frac{49}{2}$$

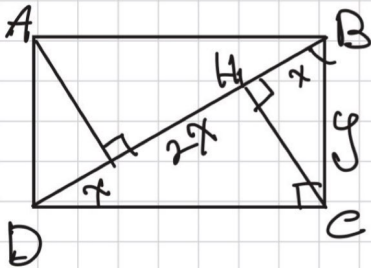
$$S = 14 \times AC = \frac{7 \times 14}{2} \Rightarrow \frac{7 \times 14}{2} = 14 \times AF \Rightarrow AF = \frac{7}{2}$$



چون ارتفاع موازی است $\triangle ABC \sim \triangle ADE \Leftrightarrow BE \perp BC \Leftrightarrow$ مثلث قائم الزاویه

$$\frac{AD}{DC} = \frac{AB}{BC} = \frac{11}{14} \Rightarrow \frac{AD}{AC} = \frac{11}{14+11} = \frac{11}{25}$$

$$DE \parallel BC \Rightarrow \triangle ABC \sim \triangle ADE \Rightarrow \frac{AE}{AB} = \frac{AD}{AC} = \frac{11}{25} \Rightarrow AE = \frac{11 \times 19}{25}$$

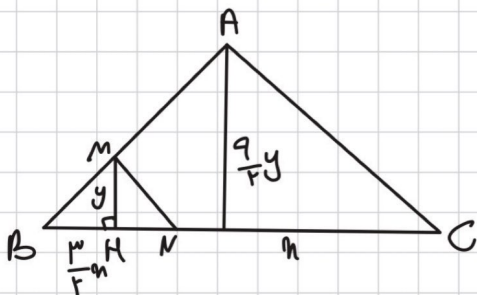


$$\left. \begin{matrix} \hat{DBC} = \hat{BCD} \\ \hat{DCB} = \hat{CDB} \end{matrix} \right\} \triangle HBC \sim \triangle DCB \Rightarrow \frac{BD}{BC} = \frac{BC}{BH} \Rightarrow \frac{5}{y} = \frac{y}{x} \Rightarrow$$

$$x \cdot y = 12 \Rightarrow x = \frac{12}{y} \quad \text{فیتاغورث: } x^2 + y^2 = CH^2 \Rightarrow 25 = CH^2 \Rightarrow CH = 5 \Rightarrow S_{HBC} = \frac{24 \sqrt{5}}{5}$$

$$\text{لذا: } DC = 2CH = 10 \Rightarrow AC = 2\sqrt{5} \Rightarrow S_{ABCD} = BC \times DC = x \times 2\sqrt{5}x =$$

$$4\sqrt{5}x^2 \Rightarrow \frac{S_{ABCD}}{S_{HBC}} = \frac{4\sqrt{5}x^2}{\frac{24\sqrt{5}}{5}} = 1$$



$$S_{\triangle MN} = S_{\triangle ABC}$$

$$\frac{S_{\triangle MN}}{S_{\triangle ABC}} = \frac{BM}{BA} \times \frac{BN}{BC} \Rightarrow \frac{1}{4} = \frac{BM}{BA} \times \frac{BN}{BC}$$

$$BM = \frac{1}{4}BA + \frac{3}{4}MA \Rightarrow \frac{BM}{MA} = \frac{1}{3}$$

