

$$AC = \sqrt{(3k)^2 + (3k)^2} = 3k\sqrt{2}$$

$$\rightarrow AF : p = \frac{AC}{2} = \frac{3k\sqrt{2}}{2}$$

$$BE = \sqrt{(3k)^2 + k^2} = k\sqrt{10}$$

$$\rightarrow EF : z = \frac{BE}{2} = \frac{k\sqrt{10}}{2}$$

$$\Rightarrow \frac{EF}{AF} = \frac{\frac{k\sqrt{10}}{2}}{\frac{3k\sqrt{2}}{2}} = \frac{\sqrt{10}}{3\sqrt{2}} = \frac{\sqrt{5}}{3}$$

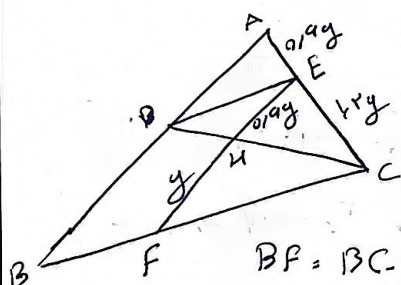
$$\left. \begin{matrix} \hat{A} = \hat{A} \\ \hat{C} = \hat{E} \end{matrix} \right\} \Rightarrow \triangle AED \cong \triangle AEB \Rightarrow \frac{y}{a+1} = \frac{a}{1a} \rightarrow y = a(a+1)$$

$$\rightarrow 21^2 + a1 - y = 0$$

$$(a+5)(a-2) = 0 \rightarrow a = 2$$

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$$y = 2a \rightarrow a = \frac{y}{2} = 0.4y$$



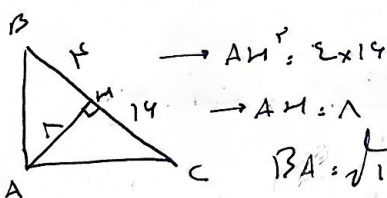
$$\triangle DHE \cong \triangle FHE \Rightarrow \frac{DE}{FC} = \frac{0.4y}{y} \Rightarrow DE = 0.4FC$$

$$DE \parallel BC \rightarrow \frac{AE}{AC} = \frac{DE}{BC} \Rightarrow \frac{0.4y}{1.1y} = \frac{DE}{BC}$$

$$\rightarrow BC = 2.75 DE \quad DE = 0.4FC \rightarrow BC = 1.1FC$$

$$BF = BC - FC = 1.1FC - 1FC = 0.1FC = 2 \Rightarrow FC = 20 \Rightarrow BC = 1.1 \times 20 = 22$$

۴, ۷, ۵



$$BA = \sqrt{14^2 + 20^2} = \sqrt{596}$$

$$AC = \sqrt{14^2 + 20^2} = \sqrt{596}$$

$$\frac{BA}{AC} = \sqrt{\frac{14^2}{20^2}} = \sqrt{\frac{1}{2}} = \frac{1}{\sqrt{2}}$$

از طرف  $AM$  باشد:  $AM^2 = BM \times MC$

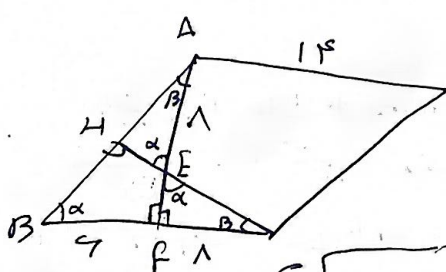
$$\rightarrow 14 = BM \times MC, \quad BM + MC = 20$$

$$BM = 20 - MC$$

$$\rightarrow 14 = (20 - MC)(MC) \Rightarrow MC^2 - 20MC + 14 = 0$$

$$MC = \frac{20 \pm \sqrt{400 - 56}}{2} = 10 \pm \sqrt{72} \approx 1 \quad \times$$

گزینه ف نامزد دین حالت ۱ شد اما قابل قبول نیست



$$\left. \begin{matrix} \hat{E} = \hat{B} \\ \hat{A} = \hat{C} \end{matrix} \right\} \Rightarrow \triangle AEF \sim \triangle EDE$$

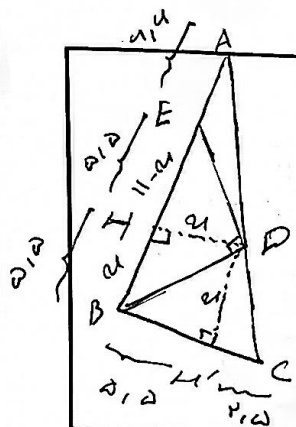
$$\frac{EF}{4} = \frac{1}{EF+1} \Rightarrow 1 = (EF)^2 + 1EF$$

$$\rightarrow EF^2 + 1EF - 2 = 0$$

$$(EF-1)(EF+2) = 0 \Rightarrow EF = 1$$

$$AF = 1 + 1 = 2$$

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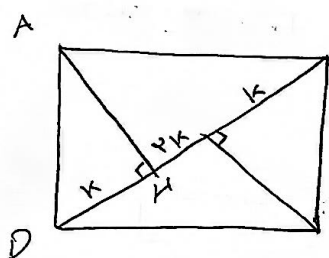


فاصله‌ی هر نقطه روی نیم‌ساز از رأس زاویه برابر است.  $\leftarrow$   $\triangle BDE$  مربع است به ضلع  $a$

$$\triangle BDE \rightarrow a^2, a(1-a) \rightarrow 2a^2 = 11a \xrightarrow{a>0} a=0 \text{ و } a=11$$

$$LD \parallel BC \rightarrow \frac{HD}{BC} = \frac{AH}{AB} \xrightarrow{\text{تثبیت دلتا}} \frac{a, a}{2, a} = \frac{AH}{a, a}$$

$$\rightarrow AH = 11, 1 \rightarrow AE = 11, 1 - a = 4, 4$$

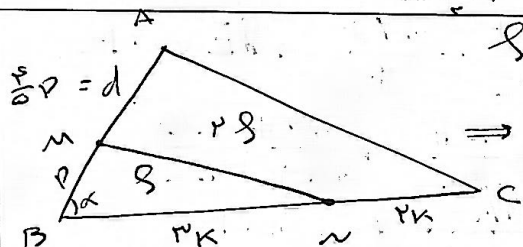


$$AH^2 = DH \times HB \Rightarrow AH = \sqrt{k \times 2k} = k\sqrt{2}$$

$$S_{ABCD} = 2S_{\triangle ABD} = 2 \times \frac{k\sqrt{2} \times 2k}{2} = 2k^2\sqrt{2}$$

$$S_{\triangle AHD} = \frac{k\sqrt{2} \times k}{2} = \frac{k^2\sqrt{2}}{2}$$

$$\Rightarrow \frac{2k^2\sqrt{2}}{k^2\sqrt{2}} = 2$$

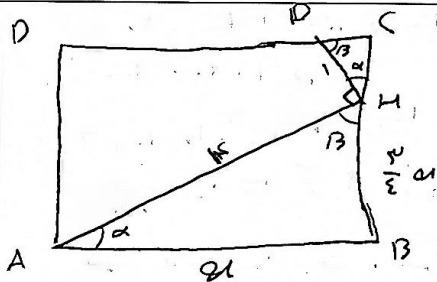


$$S = \frac{1}{2} a \cdot b \cdot \sin \alpha$$

$$\Rightarrow \frac{S_{\triangle BMN}}{S_{\triangle ABC}} = \frac{\frac{1}{2} \times p \times r \times \sin \alpha}{\frac{1}{2} \times (p+q) \times a \times \sin \alpha} = \frac{rp}{a(p+q)} = \frac{1}{3}$$

$$\rightarrow 4p, a(p+q) \rightarrow rp, aq \Rightarrow q = \frac{a}{2} p$$

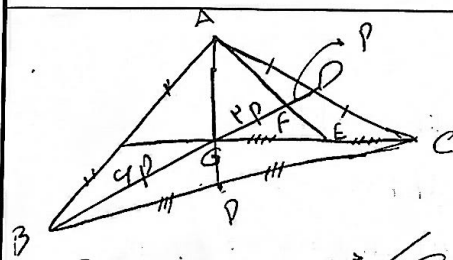
$$\Rightarrow \frac{BM}{AM} = \frac{p}{\frac{a}{2} p} = \frac{2}{a} = 1, 2a$$



$$\triangle ABH \sim \triangle DCH \Rightarrow \frac{a}{1} = \frac{a}{CH} \Rightarrow CH = \frac{a}{2}$$

$$BH = a - \frac{a}{2} = \frac{a}{2} \rightarrow 2^2 = a^2 + \frac{a^2}{4} \rightarrow a = \sqrt{\frac{14 \times 14}{5}} = \frac{14}{5}$$

$$S = a^2 = \left(\frac{14}{5}\right)^2 = 10, 24$$



می‌دانیم حرکت مثل همان محل برخورد میانه‌ها است، و این‌ها مثل میانه‌ها به نسبت ۲ به ۱ تقسیم می‌شوند.  $\leftarrow$  میانه‌ی سوم  $(AD)$  را هم

می‌کشیم. چون  $GF = EC$  و  $AD = DC$  است پس  $GB$  میانه‌ی  $AC$  است

$AE$  میانه‌ی  $BC$  است  $\triangle AGC$   $\leftarrow$   $GF = \frac{1}{2} GD, \frac{1}{2} p \leftarrow$  حرکت مثل  $G$  میانه  $DB$   $\leftarrow$  حرکت مثل  $G$   $BG = \frac{1}{2} GD = \frac{1}{2} p$

$$\Rightarrow BD = 9p + 2p + p = 12p \Rightarrow \frac{BD}{p} = \frac{12p}{p} = 12$$