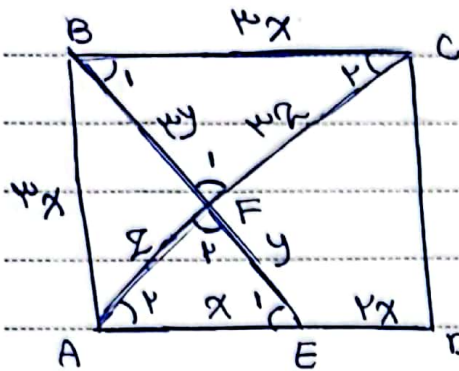


ترانه طاهریان - یازدهم دختر - تاسف ۲۱



$$ED = 2AE$$

$$\frac{EF}{AF} = ?$$

$$\begin{aligned} \Rightarrow AE &= x \\ ED &= 2x \end{aligned}$$

$$AD = BC = 3x$$

$$\frac{EF}{AF} = \frac{y}{2} = \frac{\frac{\sqrt{10}}{2}x}{2} = \frac{\sqrt{10}}{4}x$$

$$\left. \begin{aligned} BC \parallel AD, AC/ &\Rightarrow \hat{C}_r = \hat{A}_r \\ BC \parallel AD, BE/ &\Rightarrow \hat{B}_1 = \hat{E}_1 \\ &\hat{F}_1 = \hat{F}_r \text{ (مقابل در رأس)} \end{aligned} \right\} \Rightarrow \triangle BFC \sim \triangle AFE$$

$$\Rightarrow \frac{BC}{AE} = \frac{BF}{FE} = \frac{CF}{AF}$$

$$\frac{3x}{x} = \frac{3y}{y} = \frac{2x}{2} = 3$$

$$\triangle ABE \Rightarrow \text{طبق قضیه پیتاغورس: } (BE)^2 = (AE)^2 + (AB)^2$$

$$\Rightarrow (BE)^2 = x^2 + 9x^2 = 10x^2 \Rightarrow BE = x\sqrt{10}$$

$$BE = BF + FE = 3y + y = 4y$$

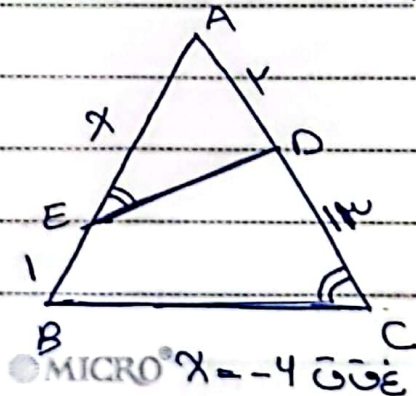
$$x\sqrt{10} = 4y \Rightarrow y = \frac{\sqrt{10}}{4}x$$

$$\triangle ABC \Rightarrow \text{طبق قضیه پیتاغورس: } (AC)^2 = (AB)^2 + (BC)^2$$

$$\Rightarrow (AC)^2 = 9x^2 + 9x^2 = 18x^2 \Rightarrow AC = 3\sqrt{2}x$$

$$AC = AF + CF = 2 + 3x = 3x$$

$$3\sqrt{2}x = 3x \Rightarrow x = \frac{3\sqrt{2}}{3}x$$



$$\Rightarrow \boxed{x = 6}$$

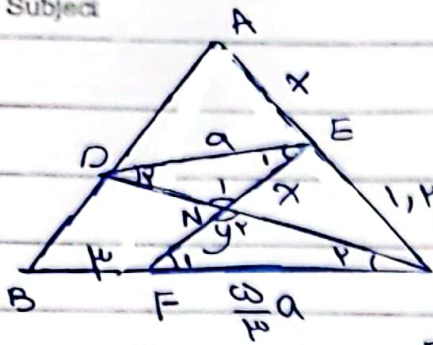
$$\left. \begin{aligned} \hat{A} &= \hat{A} \text{ (مستتر)} \\ \hat{AED} &= \hat{ACB} \end{aligned} \right\} \Rightarrow \triangle ADE \sim \triangle ABC$$

$$\Rightarrow \frac{ED}{BC} = \frac{AD}{AB} = \frac{AE}{AC}$$

$$\frac{1}{x+1} = \frac{x}{10} \Rightarrow x^2 + x = 10$$

$$\Rightarrow x^2 + x - 10 = 0 \Rightarrow (x+4)(x-6) = 0$$

Subject



$$\left. \begin{array}{l} DE \parallel BC, EF \parallel \Rightarrow \hat{E}_1 = \hat{F}_1 \\ DE \parallel BC, DC \parallel \Rightarrow \hat{D}_1 = \hat{C}_1 \\ \text{مقابلتي} \Rightarrow \hat{N}_1 = \hat{N}_2 \end{array} \right\} \quad -14$$

$$\Rightarrow \triangle DEN \sim \triangle FNC \Rightarrow \frac{DE}{FC} = \frac{EN}{NF} = \frac{DN}{NC}$$

$$DN = a$$

$$\frac{a}{FC} = \frac{x}{y} = \frac{\frac{1}{2}y}{y} = \frac{1}{2}$$

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

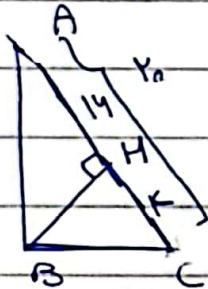
$$EC = \frac{1}{2}y = \frac{1}{2} \times \frac{2}{1}a = a$$

$$\triangle ABC \text{ ممتد } : DE \parallel BC \Rightarrow \frac{AE}{AC} = \frac{DE}{BC}$$

$$\Rightarrow \frac{x}{\frac{1}{2}x} = \frac{a}{\frac{2}{1}a + a} = \frac{1}{3} \Rightarrow 3a = \frac{2}{1}a + a$$

$$\Rightarrow \frac{1}{3}a = a \Rightarrow a = \frac{1}{3}$$

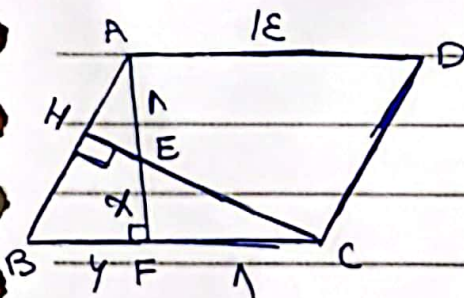
$$BC = \frac{2}{1}a + a = \frac{2}{1} \times \frac{1}{3} + a = \frac{2}{3} + a = \frac{4}{3}$$



$$(BC)^2 = CH \times AC \Rightarrow BC = \sqrt{14 \times 14} = 14$$

$$(AB)^2 = AH \times AC \Rightarrow AB = \sqrt{14 \times 14} = 14$$

$$\Rightarrow \frac{AB}{BC} = 1$$



$$\left. \begin{array}{l} \hat{B} = \hat{B} \\ \hat{H} = \hat{F} = 90^\circ \end{array} \right\} \Rightarrow \triangle ABF \sim \triangle BCH$$

$$\Rightarrow \frac{BH}{BF} = \frac{CH}{AF} = \frac{BC}{AB}$$

$$\Rightarrow \frac{BH}{4} = \frac{CH}{x+1} \quad (+)$$

$$\left. \begin{array}{l} \hat{C} = \hat{C} \\ \hat{F} = \hat{H} = 90^\circ \end{array} \right\} \Rightarrow \triangle EFC \sim \triangle HCB$$

$$\Rightarrow \frac{BC}{EC} = \frac{BH}{FE} = \frac{HC}{FC}$$

$$\Rightarrow \frac{HC}{1} = \frac{BH}{x} \quad (+)$$

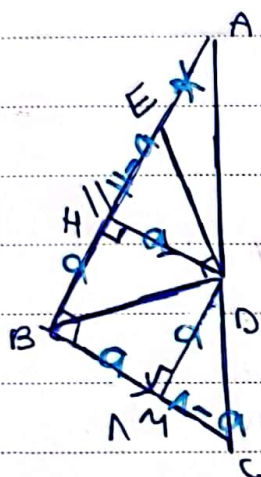
MICRO

$$\textcircled{1} \textcircled{2} \Rightarrow \frac{\frac{BH}{4}}{\frac{BH}{x}} = \frac{\frac{CH}{x+1}}{\frac{CH}{1}} \Rightarrow \frac{x}{4} = \frac{1}{x+1}$$

$$\Rightarrow x^2 + 1x = 4 \Rightarrow x^2 + 1x - 4 = 0$$

$$\Rightarrow (x+1)(x-4) = 0 \rightarrow x = -1 \text{ و } x = 4$$

$$\hookrightarrow x = 4 \Rightarrow AF = 4+1 = \boxed{5}$$



$$DH \parallel BC, HB \perp AC \Rightarrow \hat{H} = \hat{B} = 90^\circ$$

(مهرنگه روی منتهای زاویه از D و روی BD و منتهای زاویه از D و روی BC) $\Rightarrow DH = DM$
(روبرای زاویه منتهای فاصله است)

$$\left. \begin{array}{l} DH \parallel BC, HB \perp BC \\ DM \perp BC \end{array} \right\} \Rightarrow HB \parallel DM$$

چهارضلعی HDMB مربع است

$$\Delta BDE : a^2 = a(11-a) \Rightarrow 2a^2 - 11a = 0$$

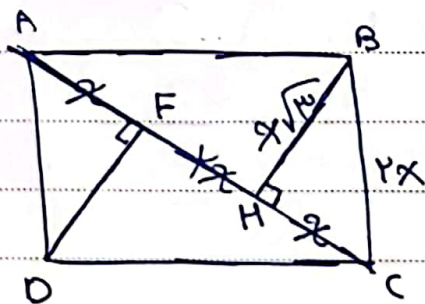
$$(AH)^2 = BH \times EH$$

$$a(2a-11) = 0 \Rightarrow a = 0 \text{ و } a = \frac{11}{2}$$

$$\Rightarrow (BC \parallel DH) \Rightarrow \frac{DH}{BC} = \frac{AH}{AB} \Rightarrow \frac{\frac{11}{2}}{11} = \frac{\frac{11}{2} + x}{11+x}$$

$$\Rightarrow \frac{11}{14} = \frac{\frac{11}{2} + x}{11+x} \Rightarrow 121 + 11x = 121 + 14x$$

$$\Rightarrow 3x = 0 \Rightarrow x = \boxed{4.4}$$



$$(BC)^2 = CH \times AC \Rightarrow (BC)^2 = x \times 2x = 2x^2$$

$$\Rightarrow BC = \sqrt{2}x$$

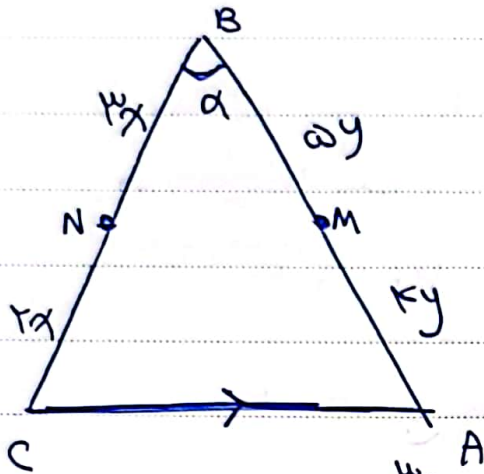
$$(AB)^2 = AH \times AC \Rightarrow (AB)^2 = 2x \times 2x = 4x^2$$

$$\Rightarrow AB = 2x$$

$$\frac{S_{ABCD}}{S_{BHC}} = \frac{2x \times \sqrt{2}x}{\frac{1}{2} \times 2x \times \sqrt{2}x} = \boxed{2}$$

$$(BH)^2 = CH \times AH = 2x \times x = 2x^2$$

$$\Rightarrow BH = \sqrt{2}x$$



$$S_{ABC} = \omega S_{BMN}$$

$$\Rightarrow \frac{1}{\omega} \times BC \times AB \times \sin \alpha = \frac{1}{\omega} \times BN \times BM \times \sin \alpha$$

$$\Rightarrow AB = \frac{1}{\omega} BM \Rightarrow BM = \omega y$$

$$AM = \epsilon y$$

$$\Rightarrow \frac{BM}{AM} = \frac{\omega}{\epsilon} = 1,25$$

$$\alpha + \beta + \gamma = 180^\circ \Rightarrow \alpha + \beta = 90^\circ$$

$$\Rightarrow \text{in } \triangle NHB : 90^\circ + \alpha + N_1 = 180^\circ$$

NHB

$$FX = \omega y$$

$$\Rightarrow N_1 = 90^\circ - \alpha = \beta$$

$$\text{in } \triangle DHC : 90^\circ + \beta + D_1 = 180^\circ$$

DHC

$$\Rightarrow D_1 = 90^\circ - \beta = \alpha$$

$$\Rightarrow \frac{BN}{CH} = \frac{BM}{CD} = \frac{1}{\epsilon}$$

$$\Rightarrow FBN = CH$$

$$FBH = CD$$

$$BC = CD$$

$$\rightarrow FY = EX + Y \Rightarrow \omega y = \epsilon x$$

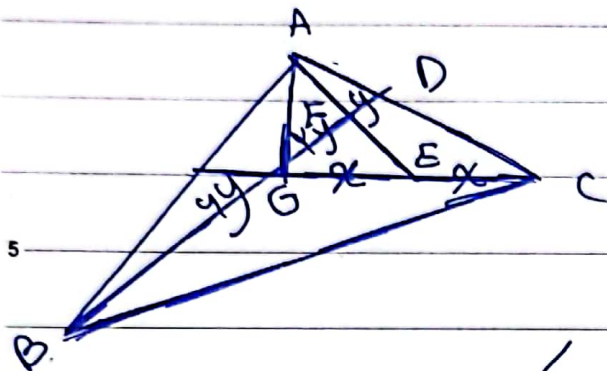
$$\text{in } \triangle DCH : (CD)^2 + (CH)^2 = (DH)^2 \Rightarrow (\omega y)^2 + (\epsilon x)^2 = (DH)^2$$

$$\Rightarrow DH = \omega y \quad \omega y = \epsilon \Rightarrow y = \frac{\epsilon}{\omega} = 0,1$$

LINOMAX

$$\Rightarrow DC = K \times \frac{K}{\omega} = \frac{14}{\omega}$$

$$S_{\text{مربع}} = \frac{14}{\omega} \times \frac{14}{\omega} = 10,24$$



گمرکز ثقل $G \leftarrow$ محل برخورد میانها است
 AC میان BD و AB میان CM $\leftarrow$

است $\leftarrow$ نسبت میانها میلر را نسبت ۲ به ۱ قطع می کنند $\leftarrow$
 $BG = 2GD = 2 \times 2y = 4y$

$\leftarrow$ مثلث GCE میان AE و AC میان DG $\leftarrow$ AGC مثلث $\rightarrow$

$$GF = 2FD = 2y$$

$$\frac{BD}{FD} = \frac{4y}{y} = 4$$

15

20