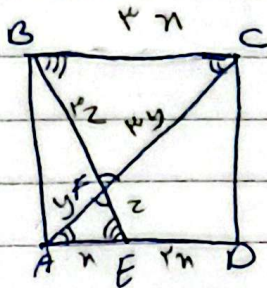


سوال ۱۶



$$ED = \frac{1}{2} AE$$

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

$$\begin{array}{l} \triangle BFC \sim \triangle AFE \rightarrow \frac{BC}{AE} = \frac{CF}{AF} = \frac{BF}{EF} \quad \text{(\>0 \>0)} \end{array}$$

~~$$\frac{P_n}{n} = P = \frac{CF}{AF} \Rightarrow P_{AF} = CF$$~~

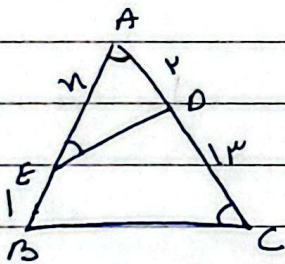
$$\frac{r_n}{n} = \frac{BF}{EF} \Rightarrow r \in F - BF$$

$$AC^T = (\psi_n)^T + (\rho_n)^T = 1 \wedge n^T \Rightarrow AC = \psi \sqrt{\psi} n$$

$$\varepsilon y = \kappa \sqrt{r} \rightarrow y = \frac{\kappa \sqrt{r}}{n}$$

$$BE^r = (Yn)^r + n^r \ln n^r \xrightarrow{\varepsilon} BE = \sqrt{10} n \quad \varepsilon Z = \sqrt{10} n \rightarrow Z = \frac{\sqrt{10} n}{\varepsilon}$$

$$\frac{EF}{AF} = \frac{z}{y} = \frac{\sqrt{10}x}{x} \times \frac{x}{3\sqrt{2}x} = \sqrt{\frac{10}{18}} = \frac{\sqrt{2}}{3}$$

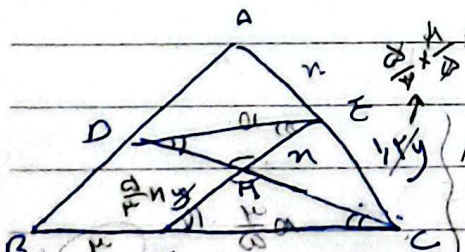


$$A \overset{D}{ED} \sim A \overset{D}{ABC} \leftarrow \left\{ \begin{array}{l} \hat{E} = \hat{C} \\ \hat{A} = \hat{B} \end{array} \right\} \Rightarrow \hat{D} = \hat{B} \text{ نس؟} \quad (\text{مسألة ٢})$$

$$\frac{AE}{AC} = \frac{AD}{AB} = \frac{ED}{BC} \Rightarrow \frac{n}{12} = \frac{r}{n+1} \Rightarrow$$

$$n^2 + n = 30 \rightarrow n^2 + n - 30 = 0 \quad (n+6)(n-5) = 0 \rightarrow n = 5$$

$$\hookrightarrow n = -4058$$



BC5? $BF = M$ ~~By an~~ $DE \parallel BC$ (M.D.A.)
 $DE \parallel BC \rightarrow \triangle ABC, \triangle ADE \sim \triangle C \rightarrow \frac{AD}{AB} = \frac{AE}{AC} = \frac{DE}{BC}$

$$\frac{r}{R} = \frac{DE}{FC} \rightarrow r + C = \frac{200}{5} DE$$

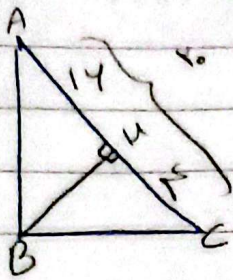
IDEA $\frac{AD}{AB} = n = \frac{DE}{FC + BF}$

$\frac{1}{\mu} = \frac{DE}{FC + \mu DE} \rightarrow \mu DE = FC + \mu$

$\rightarrow DE = \frac{\mu}{\mu - 1}, FC = 1$

$BC = \frac{\mu}{\mu - 1}$

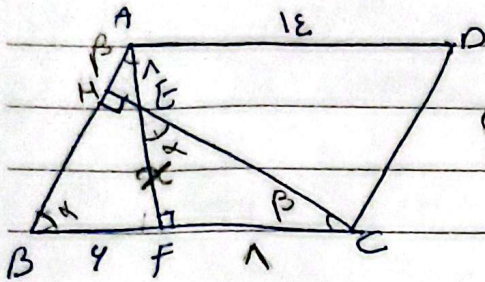
Subject:



$$BC^2 = CH \times AC \Rightarrow BC = \sqrt{2 \times 14} = \sqrt{28} \quad (\text{المطلوب})$$

$$AB^2 = AH \times AC \Rightarrow AB = \sqrt{14 \times 2} = \sqrt{28}$$

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



$$\textcircled{1} \quad \left. \begin{array}{l} \angle B = \angle C \text{ (مستقيم)} \\ \angle H = \angle F = 90^\circ \end{array} \right\} \Rightarrow \triangle ABF \sim \triangle BCH$$

$$\Rightarrow \frac{BH}{BF} = \frac{CH}{AF} = \frac{BC}{AB} \leadsto \frac{BH}{4} = \frac{CH}{x+1}$$

$$\textcircled{2} \quad \left. \begin{array}{l} \angle C = \angle C \text{ (مستقيم)} \\ \angle F = \angle H = 90^\circ \end{array} \right\} \Rightarrow \triangle EFC \sim \triangle HCB \Rightarrow$$

$$\Rightarrow \frac{HC}{1} = \frac{BH}{x}$$

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

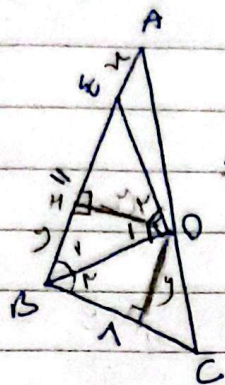
$$\textcircled{1}, \textcircled{2} \Rightarrow \frac{\frac{BH}{4}}{\frac{BH}{x}} = \frac{\frac{CH}{x+1}}{\frac{CH}{1}} \Rightarrow \frac{x}{4} = \frac{1}{x+1} \Rightarrow x^2 + 1x = 4 \Rightarrow x^2 + 1x - 4 = 0$$

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

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

IDEA

Subject:



$$B_1 = B_2$$

(40)

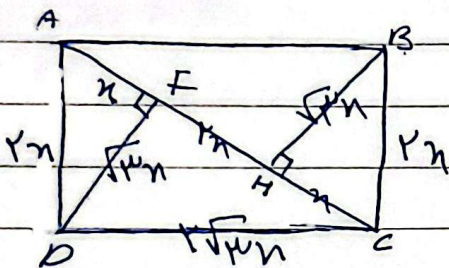
$$HD \parallel BC \Rightarrow D_1 = B_2 \Rightarrow D_1 = B_1 \Rightarrow DH = BH^*$$

$$\hat{H} = 90^\circ \Rightarrow B_1 = D_1 \text{ and } \angle \alpha \Rightarrow B_2 \text{ and } \angle \alpha$$

$$D \in B \Rightarrow EH \times BH = DH^2 \times \frac{1}{BH} \Rightarrow EH = BH = \frac{11}{1}$$

$$HD \parallel BC \Rightarrow \frac{n + \frac{11}{1}}{n + 11} = \frac{\frac{11}{1}}{1} \Rightarrow \frac{n + \frac{11}{1}}{n + 11} = \frac{11}{14}$$

$$\Rightarrow 11n + 11 = 14n + 11 \Rightarrow n = 4/4$$

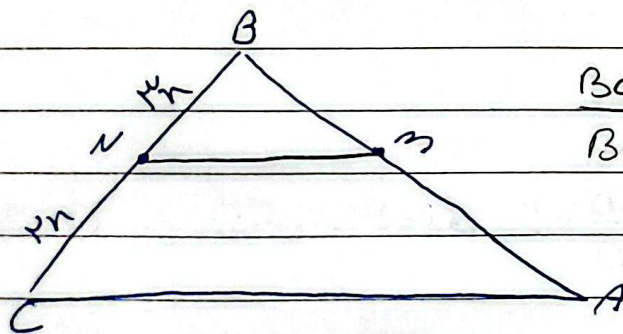


$$\frac{S_{ABCD}}{S_{BCH}} = \frac{AD \times DC}{\frac{1}{2} \times BH \times CH}$$

(40)

$$= \frac{\frac{1}{2} \times \sqrt{14} \times \sqrt{14}}{\frac{1}{2} \times \sqrt{14} \times \sqrt{14}} = 1$$

$$BC^2 = HC \times AC \Rightarrow BC = \sqrt{14}$$



$$\frac{BC \times AB \times \sin \angle B}{BN \times MB \times \sin \angle B} = 1$$

(40)

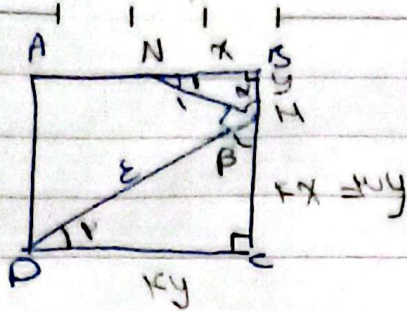
$$\frac{2 \times \sqrt{14} \times AB}{\sqrt{14} \times MB} = 1$$

$$\frac{AB}{MB} = \frac{1}{2}$$

$$\frac{BM}{AB} = \frac{2}{1} \Rightarrow \frac{BM}{AM} = \frac{2}{1}$$

IDEA

Subject:



$$\alpha + \beta + 90 = 180 \Rightarrow \alpha + \beta = 90 \quad \text{سوال 9}$$

$$\Rightarrow \text{در مثل } \triangle NHB : 90 + \alpha + N_1 = 180$$

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

$$\text{در مثل } \triangle DHC : 90 + \beta + D_1 = 180$$

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

$$\Rightarrow \left. \begin{array}{l} \hat{B} = \hat{C} = 90 \\ \hat{H}_1 = \hat{D}_1 = \alpha \\ \hat{H}_2 = \hat{N}_1 = \beta \end{array} \right\} \Rightarrow \triangle NHB \sim \triangle DHC$$

$$\frac{BN}{CH} = \frac{BH}{CD} \Rightarrow \frac{x}{y} = \frac{y}{14} \quad (BH = y)$$

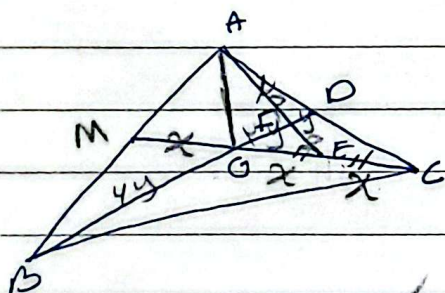
$$\Rightarrow \frac{x}{y} = \frac{y}{14} \Rightarrow x = \frac{y^2}{14}$$

$$\text{مساحت } ABCD \Rightarrow BC = DC \Rightarrow 14 = y + x \Rightarrow 14 = y + \frac{y^2}{14}$$

$$\text{در مثل } \triangle ACH : (DH)^2 = (CH)^2 + (DC)^2 \Rightarrow (DH)^2 = (y)^2 + (14)^2$$

$$\Rightarrow DH = 14y = 14 \Rightarrow y = \frac{14}{14} = 1$$

$$S_{\text{مربع}} = \frac{14}{14} \times \frac{14}{14} = 10 \quad \boxed{10}$$



$$\frac{BD}{FD} = ? \quad GE = EC \quad \text{سوال 10}$$

G مرکز ثقل است و هر یک از خطوط از G می‌گذرد و آن‌ها را 2:1 تقسیم می‌کند

در مثل ABC، CM میانه است و BO میانه است و AC میانه است

$$BG = 2GD = 2 \times 10y = 20y$$

$$GF = 2FD = 2y$$

$$\frac{BD}{FD} = \frac{20y}{2y} = 10$$

IDEA