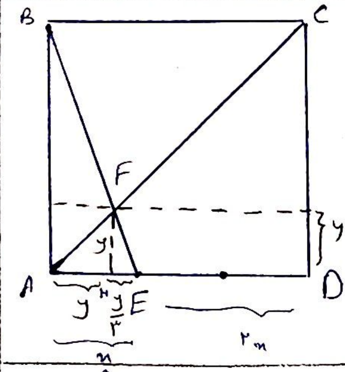
نام و نام خانوادگی ......علی منیری...... پاسخنامه تشریحی تکلیف شماره ....۲۱.... کلاس ....یازدهم A....

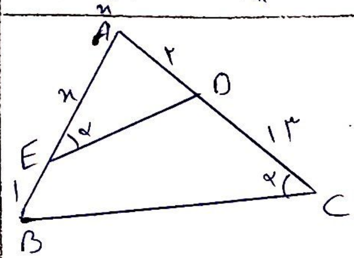


$m_{BE}=-3 \longrightarrow FH=y \longrightarrow EH=\frac{y}{3}$

$m_{AC}=1 \longrightarrow FH=y \longrightarrow AH=y$

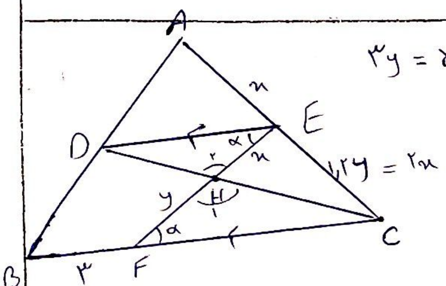
$\longrightarrow AF=\sqrt{y^2+y^2}=\sqrt{2}\,y$ ۱

$\longrightarrow FE=\sqrt{y^2+\frac{y^2}{9}}=\sqrt{\frac{10}{9}}\,y=\frac{\sqrt{10}}{3}y \longrightarrow \frac{EF}{AF}=\frac{\frac{\sqrt{10}}{3}}{\sqrt{2}}=\frac{\sqrt{5}}{3}$



$\left.\begin{array}{l}\hat{A}=\hat{A}\\ A\hat{E}D=A\hat{C}B\end{array}\right\} \longrightarrow \overset{\triangle}{ADE}\sim\overset{\triangle}{ABC} \longrightarrow \frac{AE}{AC}=\frac{AD}{AB}$

$\longrightarrow \frac{x}{15}=\frac{2}{x+1} \longrightarrow x^2+x=30 \longrightarrow x^2+x-30=0 \longrightarrow \begin{cases} x=-6 \times \\ x=5 \end{cases}$ ۲

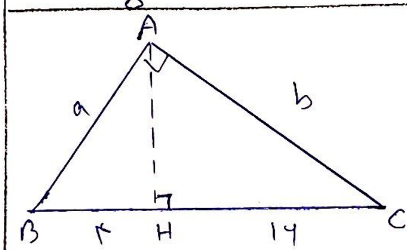


$3y=5x \longrightarrow y=\frac{5}{3}x \longrightarrow 1.2y=2x$

$\longrightarrow \left.\begin{array}{l}D\hat{E}H=H\hat{F}C\\ \hat{H}_1=\hat{H}_2\end{array}\right\} \longrightarrow \overset{\triangle}{DHF}\sim\overset{\triangle}{FHC} \longrightarrow \frac{EH}{HF}=\frac{DE}{FC}=\frac{x}{y}=\frac{3}{5}$ (1) ۳

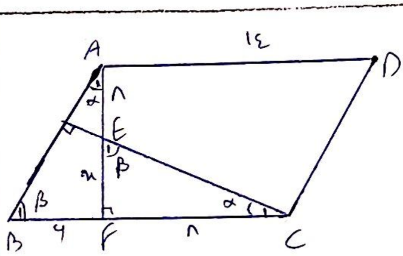
$\frac{DE}{BC}=\frac{AE}{AC}=\frac{x}{3x}=\frac{1}{3}$ (2) $\longrightarrow$ (1),(2) $\frac{DE}{FC+3}=\frac{1}{3} \longrightarrow \frac{\frac{3}{5}FC}{FC+3}=\frac{1}{3}$

$\longrightarrow \frac{9}{5}FC=FC+3 \longrightarrow \frac{4}{5}FC=3 \longrightarrow FC=\frac{15}{4} \longrightarrow BC=FC+3=\frac{15}{4}+3=\frac{27}{4}$ ✓



$\longrightarrow \begin{cases} b^2=CH\times BC=16\times 20\\ a^2=BH\times BC=4\times 20\end{cases}$ ۴

$\longrightarrow \frac{b^2}{a^2}=\frac{16}{4} \longrightarrow \frac{b}{a}=2$



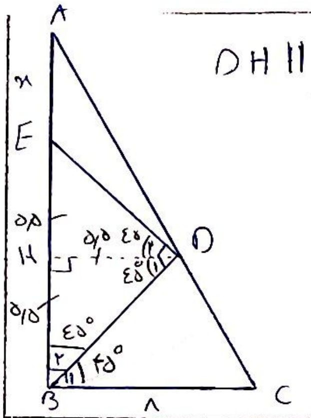
$\left.\begin{array}{l}\hat{C}_1+\hat{B}_1=90^\circ\\ \hat{B}_1+\hat{A}_1=90^\circ\end{array}\right\} \longrightarrow \hat{C}_1=\hat{A}_1$

$\left.\begin{array}{l}\hat{E}_1+\hat{C}_1=90^\circ\\ \hat{C}_1+\hat{B}_1=90^\circ\end{array}\right\} \hat{E}_1=\hat{B}_1$

$\overset{\triangle}{FCE}\sim\overset{\triangle}{ABF} \longrightarrow \frac{FC}{AF}=\frac{EF}{BF} \Rightarrow \frac{8}{8+x}=\frac{x}{6}$ ۵

$\longrightarrow x^2+8x=48 \longrightarrow x^2+8x-48=0 \longrightarrow x=\begin{cases}-12\\ 4 ✓✓\end{cases}$

$\longrightarrow AF=12$



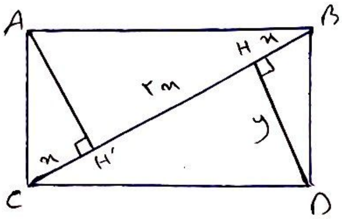
$DH \parallel BC \rightarrow \hat{H} = \hat{B} = 90^\circ$

$\rightarrow \hat{B}_1 = \hat{B}_2 = 45^\circ \xrightarrow[H=90^\circ]{D=90^\circ} \hat{D}_1 = \hat{D}_2 = 45^\circ$ 6

$\rightarrow DH = BH = HE = \frac{11}{2} = 5.5$

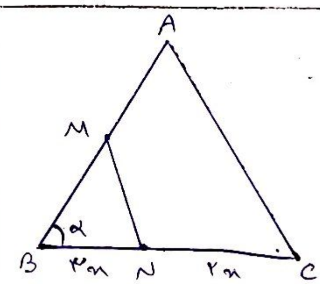
$\rightarrow \frac{x+5.5}{x+11} = \frac{5.5}{8} \rightarrow 8x + 44 = 5.5x + 60.5 \rightarrow 2.5x = 16.5$

$\rightarrow AE = x = 6.6$



$S_{\underset{ABCD}{\square}} = 2 \times \frac{y \times 4x}{2} = 4xy$

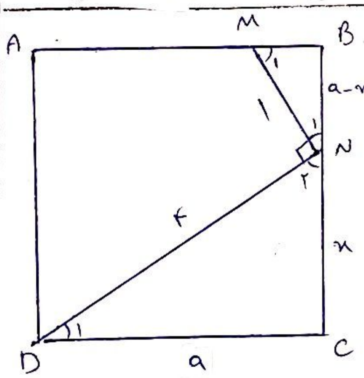
$S_{\overset{\triangle}{BHD}} = \frac{xy}{2} \rightarrow \frac{S_{ABCD}}{S_{BHD}} = \frac{4xy}{\frac{xy}{2}} = 8$ 7



$\frac{S_{ABC}}{S_{BMN}} = \frac{\frac{1}{2} BC \times AB \times \cancel{\sin\alpha}}{\frac{1}{2} BN \times BM \times \cancel{\sin\alpha}} \Longrightarrow \underbrace{\frac{BC}{BN}}_{\frac{5}{3}} \times \frac{AB}{BM} = 3$ 8

$\rightarrow \frac{5}{3} \times \frac{AB}{BM} = 3 \rightarrow \frac{AB}{BM} = \frac{9}{5} \rightarrow \frac{AB - BM}{BM} = \frac{9-5}{5}$

$\rightarrow \rightarrow \frac{AM}{BM} = \frac{4}{5} \rightarrow \frac{BM}{AM} = \frac{5}{4}$



$\left.\begin{array}{l} \hat{N}_2 + \hat{N}_1 = 90^\circ \\ \hat{N}_2 + \hat{D}_1 = 90^\circ \end{array}\right\} \rightarrow \hat{N}_1 = \hat{D}_1$

$\left.\begin{array}{l} \hat{N}_2 + \hat{N}_1 = 90^\circ \\ \hat{N}_1 + \hat{M}_1 = 90^\circ \end{array}\right\} \rightarrow \hat{M}_1 = \hat{N}_2$

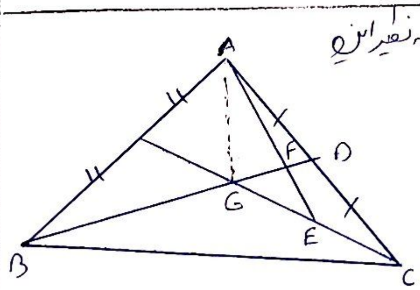
$\rightarrow \overset{\triangle}{MNB} \sim \overset{\triangle}{NCD}$

$\rightarrow \frac{DN}{MN} = \frac{DC}{NB} \rightarrow \frac{4}{1} = \frac{a}{a-x}$ 9

$\rightarrow 4a - 4x = a \rightarrow 3a = 4x \rightarrow x = \frac{3}{4}a \rightarrow a^2 + x^2 = 16$

$\rightarrow a^2 + \frac{9}{16}a^2 = 16 \rightarrow \frac{25}{16}a^2 = 16 \rightarrow a^2 = \frac{16 \times 16}{25} \rightarrow S = \frac{16 \times 16}{25} = 10.24$

مرکز ثقل محل برخورد میانه‌ها است و فاصله آن تا وسط هر ضلع برابر $\frac{1}{3}$ اندازه میانه نظیر آن ضلع است و فاصله‌اش تا هر رأس $\frac{2}{3}$ اندازه میانه نظیر آن است



$\rightarrow \frac{GD}{BD} = \frac{1}{3} \leftarrow$ GD میانه برای مثلث AGC 10

$\rightarrow FD = \frac{1}{3} GD \rightarrow \frac{FD}{BD} = \frac{1}{3} \times \frac{1}{3} = \frac{1}{9}$

$\rightarrow \frac{BD}{FD} = 9$