نام و نام خانوادگی ....ملیکا یحیی..... پاسخنامه تشریحی تکلیف شماره ..۱۲.. کلاس ..یازدهم تجربی..

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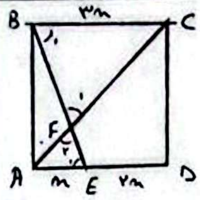

$\frac{ED}{AE}=2$ $\quad BC \parallel AE \to$ $\hat B_1=\hat E_1$ خطوط موازی و مورب، $\hat F_1=\hat F_2$ متقابل به رأس } زز $A\hat EF \sim B\hat CF$

$\to \frac{AE}{BC}=\frac{AF}{CF}=\frac{EF}{BF} \to \frac{m}{3m}=\frac{z}{CF}=\frac{y}{BF} \to BF=3y,\ CF=3z$

$B\hat AE$ فیثاغورس در $\Rightarrow (3m)^2+m^2=(3y+y)^2 \to 10m^2=16y^2 \to y=\frac{\sqrt{10}}{4}m$

$A\hat CD$ فیثاغورس در $\Rightarrow (3m)^2+(3m)^2=(3z+z)^2 \to 18m^2=16z^2 \to z=\frac{\sqrt{18}}{4}m=\frac{3\sqrt2}{4}m$

$\frac{\;}{AF}=\frac{y}{z}=\frac{\frac{\sqrt{10}}{4}m}{\frac{\sqrt{18}}{4}m}=\boxed{\frac{\sqrt5}{3}}$

۲

$\hat A=\hat A$ مشترک، $A\hat ED=A\hat CB$ } $\xrightarrow{زز}$ $A\hat DE \sim A\hat BC \to \frac{AD}{AB}=\frac{AE}{AC}=\frac{ED}{BC}$

$\Rightarrow \frac{2}{m+1}=\frac{m}{15} \to m^2+m=30 \to m^2+m-30=0 \to (m-5)(m+6)=0$

$\to \boxed{m=5}$ ق ق

$\to m=-6$ غ ق ق

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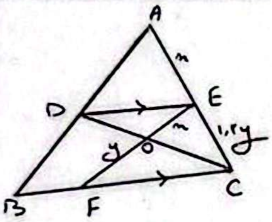

$DE \parallel BC \to \frac{EO}{FO}=\frac{DO}{CO}=\frac{DE}{FC} \xrightarrow{1} \frac{\frac{3}{5}y}{y}=\frac{DE}{FC}$

$3y=5m \to m=\frac{3}{5}y$ (۲)

$\frac{DE}{FC}=\frac{3}{5} \to DE=3z,\ FC=5z$

تالس در $A\hat BC$: $\frac{AE}{AC}=\frac{DE}{BC} \to \frac{m}{3m}=\frac{3z}{BC} \to BC=9z \to 3+\underbrace{FC}_{5z}=9z$ ($BC=BF+FC$)

$AC=AE+\underbrace{EC}_{1.2y}=m+\underbrace{1.2y}_{1.2\times\frac{5}{3}m}=3m$

$\Rightarrow 4z=3 \to z=\frac{3}{4}$

$\Rightarrow \boxed{FC=5z=\frac{15}{4}}$

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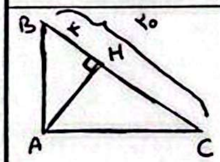

$\underbrace{BC}_{20}=\underbrace{BH}_{4}+HC \to CH=16$

$AC^2=HC\times BC \to AC^2=\underbrace{16\times20}_{320} \to \boxed{AC=8\sqrt5}$

$AB^2=BH\times BC \to AB^2=4\times20 \Rightarrow \boxed{AB=4\sqrt5}$

$\boxed{\frac{AC}{AB}=\frac{8\sqrt5}{4\sqrt5}=2}$

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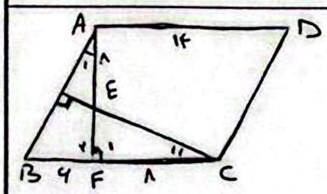


$\hat F_1=\hat F_2=90^\circ$، $\hat B=\hat B$ مشترک، $\hat A_1+\hat B=90^\circ$، $\hat C_1+\hat B=90^\circ$ } $\hat A_1=\hat C_1$ } $\xrightarrow{زز}$ $A\hat BF \sim E\hat FC \to \frac{CF}{AF}=\frac{EF}{BF}=\frac{CE}{AB}$

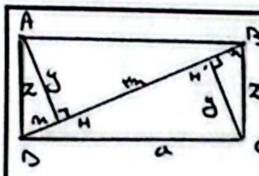
$\Rightarrow \frac{8}{8+EF}=\frac{EF}{6} \to 8EF+(EF)^2=48$

$EF=t \Rightarrow t^2+8t-48=0 \to (t+12)(t-4)=0$

$\to t=EF=-12$ غ ق ق

$\to \boxed{t=EF=4}$ ق ق

$\boxed{AF=EA+EF=4+8=12}$



$y^2 = x \times 3x = 3x^2 \rightarrow y = \sqrt{3}x$

$z^2 = y^2 + x^2 = 3x^2 + x^2 = 4x^2 \rightarrow z = 2x$

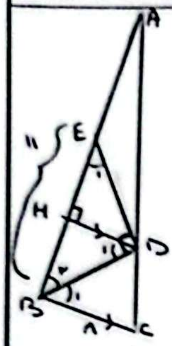
$a^2 = \underset{(4x)^2}{(BD)^2} - \underset{(2x)^2}{BC^2} = 16x^2 - 4x^2 = 12x^2 \rightarrow a = 2\sqrt{3}x$

$S_{\hat{ADH}} = \frac{xy}{2} = \frac{x \times \sqrt{3}x}{2} = \frac{\sqrt{3}}{2}x^2$

$S_{\text{مستطیل}} = AB \cdot BC = az = 2\sqrt{3}x \times 2x = 4\sqrt{3}x^2$

$\frac{S_{\text{مستطیل}}}{S_{\hat{ADH}}} = \frac{4\sqrt{3}x^2}{\frac{\sqrt{3}}{2}x^2} = 8$

سوال ۷



BD نیمساز $\rightarrow \hat{B}_1 = \hat{B}_2$

$\hat{B}_1 = \hat{D}_1$ خطوط موازی

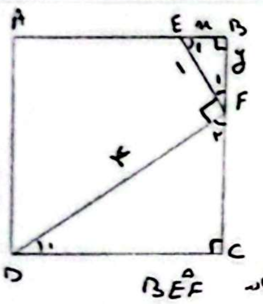
$HD \parallel BC \longrightarrow \hat{H} = \hat{B} = 90^\circ \rightarrow \hat{B}_1 = \hat{B}_2 = \hat{D}_1 = \frac{90}{2} = 45^\circ$

$\underset{45}{\hat{B}_2} + \hat{E}_1 = 90 \rightarrow E_1 = 45^\circ \rightarrow$ $E\hat{B}D$ متساوی الساقین است $\rightarrow EH = BH = \frac{11}{2} = HD$

$A\hat{B}C$ تالس: $\frac{AH}{AB} = \frac{HD}{BC} \rightarrow \frac{AE + \frac{11}{2}}{AE + 11} = \frac{\frac{11}{2}}{8} \rightarrow \frac{2AE + 11}{AE + 11} = \frac{11}{8}$

$\rightarrow 16AE + 88 = 11AE + 121 \rightarrow 5AE = 33 \rightarrow AE = \frac{33}{5} = 6.6$

سوال ۴



$\left.\begin{array}{l}\hat{B} = \hat{C} = 90^\circ \\ \left.\begin{array}{l}\hat{F}_1 + \hat{F}_2 = 90^\circ \\ \hat{E}_1 + \hat{F}_1 = 90^\circ\end{array}\right\} \hat{E}_1 = \hat{F}_2\end{array}\right\} \xrightarrow{\text{زز}} D\hat{F}C \sim B\hat{E}F \rightarrow \frac{EF}{DF} = \frac{BE}{FC} = \frac{BF}{DC}$

$\Rightarrow \frac{1}{4} = \frac{x}{FC} = \frac{y}{DC} \rightarrow FC = 4x,\ DC = 4y$

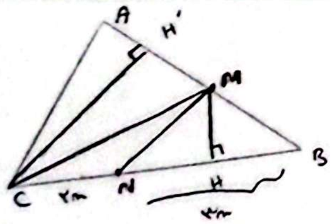
$BF + FC = DC \rightarrow 4x + y = 4y \rightarrow 4x = 3y \rightarrow x = \frac{3}{4}y$

$B\hat{E}F$ فیثاغورس: $x^2 + y^2 = 1 \rightarrow \frac{9}{16}y^2 + y^2 = 1 \rightarrow \frac{25}{16}y^2 = 1 \rightarrow y = \frac{4}{5}$

ضلع مربع $= 4y = 4 \times \frac{4}{5} = \frac{16}{5}$

$S = (\frac{16}{5})^2 = \frac{256}{25}$

سوال ۹



$\frac{BN}{NC} = \frac{3}{2}$

$MH \Rightarrow h_{M\hat{N}B},\ h_{M\hat{C}B} \rightarrow \frac{S_{M\hat{N}B}}{S_{M\hat{C}B}} = \frac{\frac{1}{2} \times MH \times BN}{\frac{1}{2} \times MH \times CB} = \frac{BN}{CB}$

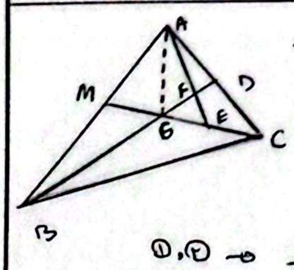
$\Rightarrow \frac{3m}{5m} = \frac{3}{5}$

$S_{M\hat{B}C} = 5m$

$S_{A\hat{M}C} + S_{B\hat{M}C} = S_{A\hat{B}C} \rightarrow S_{A\hat{M}C} + 5m = 9m \rightarrow S_{A\hat{M}C} = 4m$

$CH' = h_{C\hat{M}A},\ h_{C\hat{B}M} \rightarrow \frac{S_{C\hat{M}A}}{S_{MCB}} = \frac{\frac{1}{2} \times CH' \times AM}{\frac{1}{2} \times CH' \times MB} = \frac{AM}{BM} \Rightarrow \frac{4m}{5m} = \frac{AM}{BM} \rightarrow \frac{BM}{AM} = \frac{5}{4}$

سوال ۸



محل برخورد میانه ها G مرکز ثقل مثلث $A\hat{B}C$ است $\Rightarrow$ BD و CM میانه اند

می دانیم میانه ها یکدیگر را به نسبت ۱ به ۲ تقسیم می کنند

$\rightarrow \frac{DG}{BD} = \frac{1}{3}$ ①

$A\hat{G}C \Rightarrow$: AE و GD میانه $\rightarrow \frac{FD}{GD} = \frac{1}{3}$ ②

①,② $\rightarrow \frac{DG}{BD} \times \frac{FD}{GD} = \frac{1}{3} \times \frac{1}{3} \rightarrow \frac{FD}{BD} = \frac{1}{9} \rightarrow \frac{BD}{DF} = 9$

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