سانیا هادیانی — یازدهم ریاضی ۸ — تکلیف ۲۱

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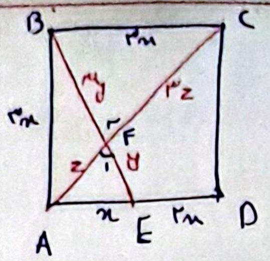

$BE = \sqrt{10}\,x$

$AC = 3\sqrt{2}\,x$

$\Rightarrow 4z = 3\sqrt{2}\,x \Rightarrow z = \frac{3\sqrt{2}\,x}{4}$

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

$\frac{EF}{AF} = \frac{\frac{\sqrt{10}\,x}{4}}{\frac{3\sqrt{2}\,x}{4}} = \frac{\sqrt{10}}{3\sqrt{2}} \times \frac{3\sqrt{2}}{3\sqrt{2}} = \frac{3\sqrt{20}}{9\times 2} = \frac{3\times 2\sqrt{5}}{9\times 2} = \boxed{\frac{\sqrt{5}}{3}}$

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$AED \sim ABC$

$A = A$

$E = C$

$D = B$

$\Rightarrow \frac{2}{x+1} = \frac{ED}{BC} = \frac{x}{15} \Rightarrow x^2 + x = 30 \Rightarrow x^2 + x - 30 = 0$

$\Rightarrow x = 5, -6$

$\boxed{5}$

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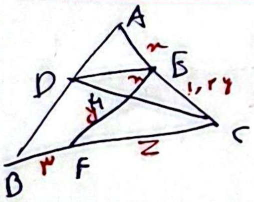

$3y = 5x \Rightarrow \frac{x}{y} = \frac{3}{5} \Rightarrow \frac{DE}{z} = \frac{3}{5} \Rightarrow DE = \frac{3}{5}z$

$ABC \Rightarrow \frac{DE}{BC} = \frac{AE}{AC} \Rightarrow \frac{\frac{3}{5}z}{3+z} = \frac{x}{x+1{,}2y} \Rightarrow \frac{\frac{3}{5}z}{3+z} = \frac{x}{3x} \Rightarrow \frac{\frac{3}{5}z}{3+z} = \frac{1}{3} \Rightarrow z = 3{,}75$

$\Rightarrow BC = 3 + 3{,}75 = \boxed{6{,}75}$

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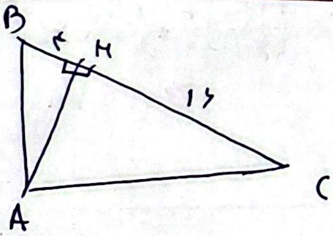

$AH^2 = BH \times CH = 64 \Rightarrow AH = 8$

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

$ABH \sim ABC$

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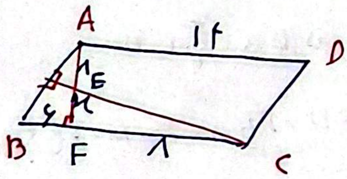
۵-

$BAF \sim ECF \Rightarrow \frac{BF}{EF} = \frac{AF}{CF} \Rightarrow \frac{6}{x} = \frac{8+x}{8} \rightarrow x(x+8) = 48 \Rightarrow x = 4$

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



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(سوال ۶ را بعد از ۷ نوشتم حواسم پرت شد

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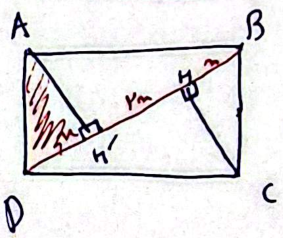

$h^2 = x \times 3x \rightarrow h = \sqrt{3}\,x$

$S_{\text{مستطیل}} = 2 \times S_{ABD} = 2 \times \frac{\sqrt{3}x \times 4x}{2} = \sqrt{3}\,x \times 4x = 4\sqrt{3}\,x^2$ (۱)

$S_{\text{مثلث}} = \frac{h \times x}{2} = \frac{\sqrt{3}\,x^2}{2}$ (۲)

$\rightarrow \frac{(1)}{(2)} = \frac{4\sqrt{3}\,x^2}{\frac{\sqrt{3}\,x^2}{2}} = \boxed{8}$

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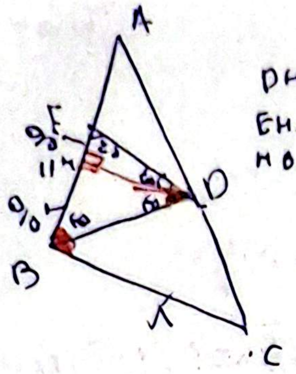


DH = ۵,۵
EH = ۵,۵
HB = ۵,۵

$AHD \sim ABC \Rightarrow \frac{AH}{AB} = \frac{HD}{BC} = \frac{۵,۵}{۸} = \frac{۰,۵ + AE}{۱۱,۲ + AE}$

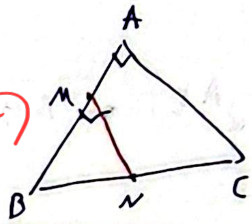
$۴۴ + ۸AE = ۵,۵AE + ۲۰,۵$

$۲,۵AE = ۲۳,۵$

$AE = ۹,۴$

۱۸

$\frac{S_{BMN}}{S_{ABC}} = \frac{BM \times BN}{BA \times BC} = \frac{BM}{AB} \times \frac{۳}{۵} = \frac{۱}{۳} \rightarrow \frac{BM}{AB} = \frac{۵}{۹} \Rightarrow \frac{BM}{AM} = \frac{۵}{۴} = ۱,۲۵$



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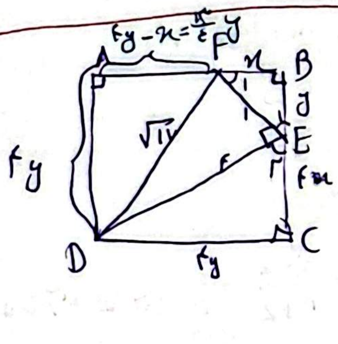


$۹۰ + F_1 = ۹۰ + E_2 \Rightarrow E_2 = F_1$, $B = C$ } $FBE \sim DCE$

$۴x = y$, $۴y$

$۴x = ۳y$

$x = \frac{۳}{۴} y$

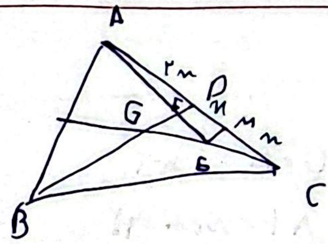
$\Rightarrow \frac{FE}{DE} = \frac{FB}{EC} = \frac{BE}{DC} = \frac{۱}{۴}$

$\Rightarrow ۱۷ = (\frac{۱۳}{۴} y)^2 + (۴y)^2 \Rightarrow ۱۷ = \frac{۱۶۹}{۱۶} y^2 + ۱۶y^2 \Rightarrow ۱۷ = \frac{۴۲۵}{۱۶} y^2 \Rightarrow y^2 = ۰,۶۴$

$\Rightarrow y = ۰,۸$

$\Rightarrow DC = ۴ \times ۰,۸ = ۳,۲ \Rightarrow S = ۳,۲ \times ۳,۲ = ۱۰,۲۴$

۲۰



$EM \parallel GD \rightarrow \frac{EC}{EG} = \frac{CM}{DM} \xrightarrow{EC = EG} = ۱$ از E ، M دو رسم

$\Rightarrow \frac{CM}{DM} \Rightarrow CM = DM$

$AD = ۲m$ ، $۲ = CM = DM = m$

$FD \parallel EM \rightarrow \frac{AD}{AM} = \frac{FD}{EM} = \frac{۲m}{۳m} = \frac{FD}{EM} \Rightarrow EM = \frac{۳}{۲} FD$

$EM \parallel DG \rightarrow \frac{CM}{CD} = \frac{EM}{GD} = \frac{m}{۲m} = \frac{EM}{GD} \Rightarrow GD = ۲EM \rightarrow GD = ۲(\frac{۳}{۲} FD)$

$\Rightarrow GD = ۳FD$ ، $\Rightarrow \frac{BD}{FD} = ۹ \Leftarrow \frac{۱}{۳} = \frac{۳FD}{BD} \Leftarrow \frac{GD}{BD} = \frac{۱}{۳}$