نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ..... کلاس ..... نوبت صبح .....

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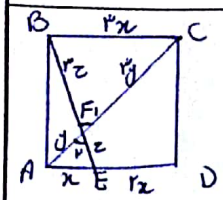

$AE \parallel BC \Rightarrow \hat{F}_1 = \hat{F}_2,\ \hat{B} = \hat{E},\ \hat{A} = \hat{C} \rightarrow \triangle AEF \sim \triangle FBC \Rightarrow$ نسبت تشابه $= 3$

$AB^2 + AE^2 = BE^2 \rightarrow BE = \sqrt{10}m = 4z \Rightarrow EF = \frac{\sqrt{10}}{4}m$

$AC^2 = AD^2 + CD^2 \rightarrow AC = \sqrt{18}m = 4y \Rightarrow AF = \frac{\sqrt{11}}{4}m$

$\frac{EF}{AF} = \frac{\frac{\sqrt{10}}{4}m}{\frac{\sqrt{18}}{4}m} = \boxed{\frac{\sqrt{5}}{3}}$

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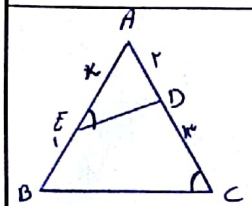

$\hat{A} = \hat{A}$ زاویه مشترک، $\hat{E} = \hat{C} \rightarrow \triangle AED \sim \triangle ABC$

$\frac{AD}{AB} = \frac{ED}{BC} = \frac{AE}{AC} \rightarrow \frac{2}{x+1} = \frac{x}{15} \Rightarrow x^2 + x = 30 \Rightarrow x^2 + x - 30 = 0$

$(x-5)(x+6) = 0$

$x = -6$ قبول نیست

$\boxed{x = 5}$

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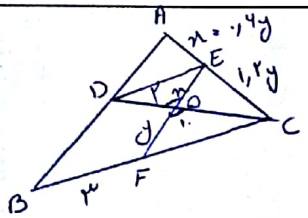

$3y = 5x \rightarrow x = 1.4y$

$\frac{DE}{BC} = \frac{AE}{AC} = \frac{1}{3} \rightarrow BC = 3DE$

$\hat{O}_1 = \hat{O}_2,\ \hat{E} = \hat{F},\ \hat{D} = \hat{C} \rightarrow \triangle HDE \sim \triangle HCF$

$\frac{EH}{HF} = \frac{DE}{FC} = \frac{DH}{HC} = \frac{1.4y}{y} = \frac{7}{5}$

$\frac{DE}{FC} = \frac{3m}{5m} \rightarrow \frac{DE}{FC+BF} = \frac{3m}{5m+3} = \frac{1}{3} \Rightarrow 9m = 5m + 3 \Rightarrow 4m = 3 \Rightarrow m = \frac{3}{4}$

$BC = 5m + 3 = \frac{3}{4} \times 5 + 3 = \boxed{\frac{27}{4}}$

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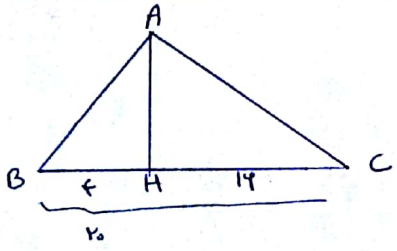

$AC^2 = CH \times BC \rightarrow AC^2 = 14 \times 20 \Rightarrow AC = 8\sqrt{5}$

$AB^2 = BH \times BC \rightarrow AB^2 = 4 \times 20 \Rightarrow AB = 4\sqrt{5}$

$\frac{AB}{AC} = \frac{4\sqrt{5}}{8\sqrt{5}} = \boxed{\frac{1}{2}}$

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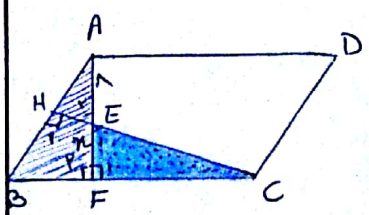


$\hat{E}_1 = \hat{E}_2,\ \hat{F}_1 = \hat{H}_1 = 90 \Rightarrow \hat{A}_1 = \hat{C}_1$

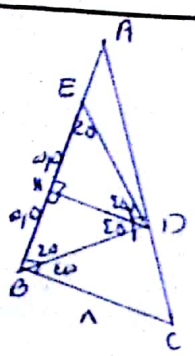
$\hat{A}_1 = \hat{C}_1,\ \hat{F}_1 = \hat{H}_1 \rightarrow \triangle ABF \sim \triangle CEF \Rightarrow \frac{BF}{EF} = \frac{AF}{FC} \Rightarrow \frac{4}{x} = \frac{8+m}{8} \Rightarrow$

$x^2 + 8m = 48 \rightarrow x^2 + 8m - 48 = 0 \quad (m+12)(m-4) = 0$

$m = -12$ قبول نیست

$m = 4$

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



$\left.\begin{matrix} HD = HD \\ D_1 = E \\ D_2 = B \end{matrix}\right\} \Rightarrow \triangle HDB \sim \triangle HDE \Rightarrow BH = HE \Rightarrow 12 = 11 \Rightarrow x = 4.5$

$BC \parallel HD \Rightarrow \frac{AH}{HB} = \frac{HD}{BC - HD} \Rightarrow \frac{3.5+m}{3.5} = \frac{3.5}{2.5} \Rightarrow 10.25 = 12.75 + 2.5m$

$4.5 = 2.5m \Rightarrow m = 1.8$

$AE = 4.4$

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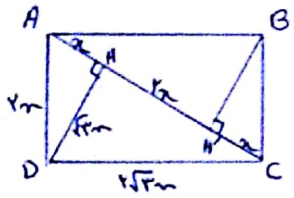

$DH^2 = AH \times HC \Rightarrow DH^2 = 12^2 \Rightarrow DH = \sqrt{12}m$

$AD^2 = AH^2 + DH^2 \Rightarrow AD^2 = 4^2 \Rightarrow AD = 2m$

$DC^2 = DH^2 + HC^2 \Rightarrow DC^2 = 12^2 \Rightarrow DC = 2\sqrt{12}m$

$\frac{S_{ABCD}}{S_{ADH}} = \frac{(4\sqrt{12})(2m)}{(\frac{1}{2})(\sqrt{12}m)(m)} = 8$

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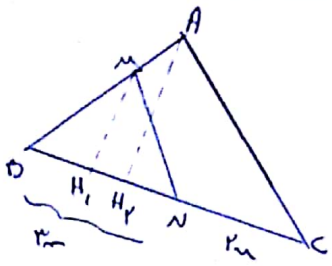

$MH_1 \parallel AH_2$

$\frac{S_{BMN}}{S_{ABC}} = \frac{MH_1 \times 2m}{AH_2 \times 4m} = \frac{1}{2} \Rightarrow \frac{MH_1}{AH_2} = \frac{5}{9} = \frac{BM}{AB}$

$\frac{BM}{AB - BM} = \frac{5}{9-5} \rightarrow \frac{BM}{AM} = \frac{5}{4}$

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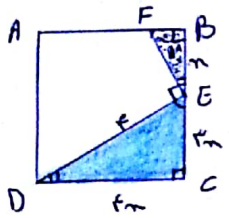

$\left.\begin{matrix} \hat{E} = \hat{D} \\ \hat{F} = \hat{E} \end{matrix}\right\} \rightarrow \triangle EFB \sim \triangle DEC$

$\frac{DE}{EF} = \frac{DC}{BE} = \frac{CE}{FB} = 2$ $\quad DC = 2FB$, $EC = 2BE$

$DE^2 = DC^2 + EC^2 \rightarrow 14 = 14m^2 + 9m^2 \rightarrow m^2(14+9) = 14 \Rightarrow 5m = 4 \Rightarrow m = \frac{4}{\sqrt{5}}$

$DC = 4m = 4 \times \frac{2}{5} = 3.2$ $\quad S_{ABCD} = 3.2 \times 3.2 = 10.24$

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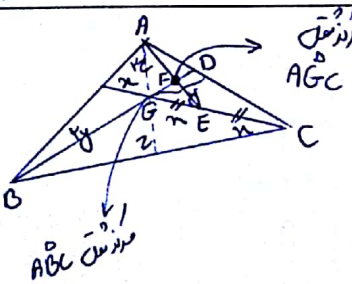

محل تلاقی میانه‌ها = محل تلاقی نیمسازها $\Rightarrow GF = \frac{2y}{3}$, $FD = \frac{y}{3}$

$\frac{BD}{FD} = \frac{2y+y}{\frac{y}{3}} = \frac{\frac{3y}{1}}{\frac{y}{3}} = 9$

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