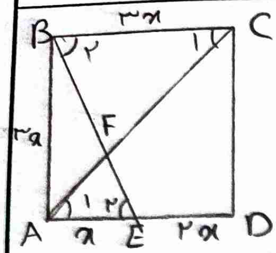
نام و نام خانوادگی ...[illegible]... پاسخنامه تشریحی تکلیف شماره ..۲۱.. کلاس ....یازدهم ریاضی A.......

۱



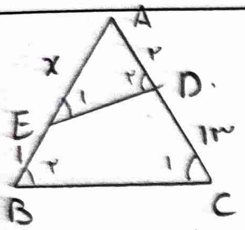
$\overline{BC} \parallel \overline{AE}$, $\overline{BE}$, $\overline{AC}$ مورب $\longrightarrow \hat{C}_1 = \hat{A}_1$, $\hat{B}_2 = \hat{E}_2$

$\xrightarrow{زز} \overset{\triangle}{BCF} \simeq \overset{\triangle}{AFE} \longrightarrow \frac{AE}{BC} = \frac{AF}{CF} = \frac{FE}{BF} = \frac{1}{3}$

$BE = \sqrt{AB^2 + AE^2} = \sqrt{10}\,x$, $AC = 3\sqrt{2}\,x$

$\left.\begin{array}{l} BF = 3FE \to \sqrt{10}\,x = 4EF \to FE = \frac{\sqrt{10}}{4}x \\ CF = 3AF \to 3\sqrt{2}\,x = 4AF \to \frac{3\sqrt{2}}{4}x = AF \end{array}\right\} \frac{FE}{AF} = \frac{\sqrt{5}}{3}$

۲



$\hat{A} = \hat{A}$, $A\hat{E}D = A\hat{C}B \longrightarrow AED \sim ABC$

$\longrightarrow \frac{AC}{AE} = \frac{AB}{AD} = \frac{BC}{ED} \to \frac{15}{x} = \frac{1+x}{2} \to x(x+1) = 30$

$\to \boxed{x = 5}$

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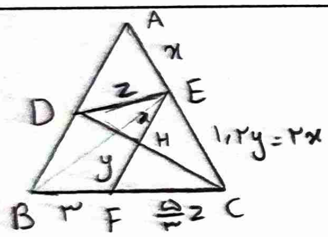
۳



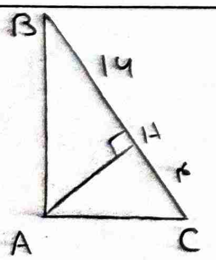
$3y = 5x \to y = \frac{5}{3}x$

$\overline{DE} \parallel \overline{BC} \xrightarrow{تالس} \frac{AE}{AC} = \frac{DE}{BC} = \frac{1}{3}$

$\overline{DE} \parallel \overline{FC} \longrightarrow \frac{DH}{HC} = \frac{HE}{HF} = \frac{DE}{FC} \to \frac{z}{FC} = \frac{x}{\frac{5}{3}x} \to FC = \frac{5}{3}z$

$\to \frac{z}{3 + \frac{5}{3}z} = \frac{1}{3} \to z = \frac{9}{4} \to BC = 3 + 2.25 = \boxed{5.25}$

۴

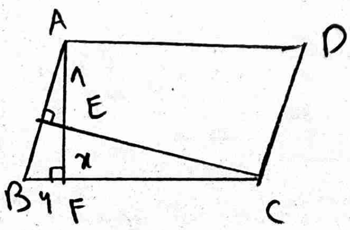


$AC^2 = CH \cdot BC = 4 \times 20 \to AC = 4\sqrt{5}$

$AB^2 = BH \cdot BC = 16 \times 20 \to AB = 8\sqrt{5}$

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

۵



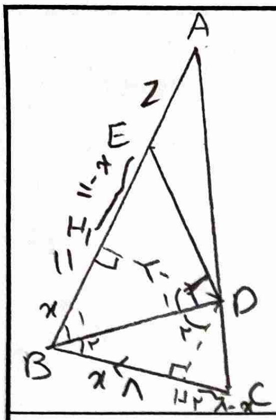
$\left.\begin{array}{l} \hat{A} = \hat{C} \\ \hat{F}_1 = \hat{F}_2 \end{array}\right\} \xrightarrow{زز} A\hat{B}F \sim C\hat{F}E$

$\to \frac{BF}{EF} = \frac{AF}{CF}$

$\to \frac{6}{x} = \frac{8+x}{8} \to x = 4$

$\to AF = 8 + 4 = 12$

۶



$DH_1 \parallel BC \to \hat{B} = ۹۰^\circ$

$\frac{۸-x}{۸} = \frac{\sqrt{۱۱x - x^۲}}{z+۱۱}$ $\qquad z = ۶٫۶$

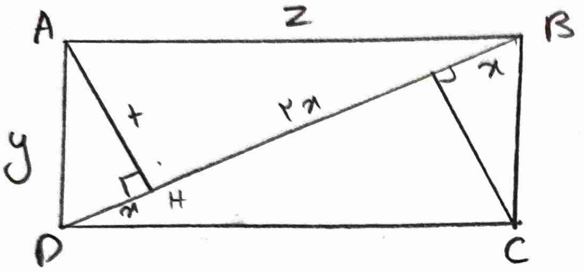
$\left.\begin{array}{l} BD = DB \\ \hat{B}_۱ = \hat{B}_۲ \\ \hat{D}_۱ = \hat{D}_۲ \end{array}\right\} \xRightarrow{\text{ضزض}} B\overset{\triangle}{H_۱}D \cong B\overset{\triangle}{H_۲}D$ $\qquad \hookrightarrow \frac{۵}{۱۶} = \frac{۱۱}{۲(z+۱۱)}$

$\hookrightarrow BH_۱ = BH_۲ = x$

$\hat{B}_۱ = \hat{B}_۲ = ۴۵ \to \hat{D}_۱ = \hat{D}_۲ = ۴۵ \to \overline{BH_۱} = \overline{H_۱D}$

$H_۱D = \sqrt{H_۱E \cdot H_۱B} = \sqrt{۱۱x - x^۲} \to x = \sqrt{۱۱x - x^۲} \to x = \frac{۱۱}{۲}$

۷



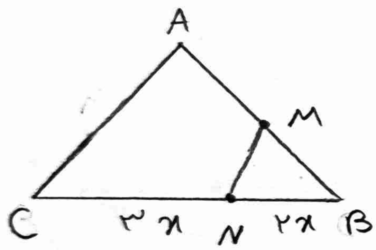
$z^۲ + y^۲ = ۱۶x^۲$

$z^۲ = ۹x^۲ + t^۲ \,,\; y^۲ = x^۲ + t^۲$

$\hookrightarrow ۱۰x^۲ + t^۲ = ۱۶x^۲ \to t = x\sqrt{۶}$

$\frac{S_{ABCD}}{S_{ADH}} = \frac{\sqrt{۶}\,x \cdot ۴x}{\frac{x \cdot \sqrt{۶}x}{۲}} = ۸$

۸

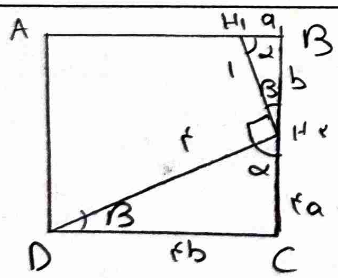


$\frac{S_{A\overset{\triangle}{B}C}}{S_{B\overset{\triangle}{M}N}} = \frac{۵x \cdot \sin\alpha \cdot AB}{۲x \cdot \sin\alpha \cdot BM}$

$\hookrightarrow \frac{۵}{۲} \times \frac{AB}{BM} = ۳ \to \frac{AB}{BM} = \frac{۶}{۵}$

$\hookrightarrow \frac{BM}{AM} = \frac{۵}{۶}$

۹



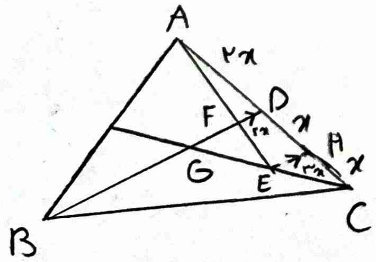
$B\overset{\triangle}{H_۱}H_۲ \sim D\overset{\triangle}{C}H_۲ \to \frac{BH_۱}{CH_۲} = \frac{BH_۲}{CD} = \frac{۱}{۴}$

$۴a + b = ۴b \to ۴a = ۳b \to a = \frac{۴}{۳}b$

$\to \frac{۱۶}{۹}b^۲ + b^۲ = ۱ \to b = \frac{۳}{۵},\; a = \frac{۴}{۵}$

$S = (۴b)^۲ = \frac{۱۴۴}{۲۵}$

۱۰



$EA \parallel GD \to \frac{CE}{GE} = \frac{CA}{FD} = ۱$

$\hookrightarrow \frac{AD}{AH} = \frac{FD}{EH} \to \frac{FD}{EH} = \frac{۲}{۳} \to FD = ۲x \,,\; EH = ۳x$

$\hookrightarrow \frac{CH}{CD} = \frac{EH}{GD} \to GD = ۶x \Rightarrow BG = ۲ \times GD = ۱۲x$

$\hookrightarrow DB = ۱۸x \Rightarrow \frac{BD}{FD} = \frac{۱۸x}{۲x} = ۹$