نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ۲۲ کلاس .....

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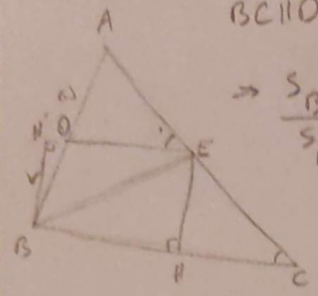

$BC \parallel DE \Rightarrow EH = BH'$ $\quad S_{\hat{BDE}} = \frac{BH' \times DE}{2}$ $\quad S_{\hat{BEC}} = \frac{EH \times BC}{2}$

$\Rightarrow \frac{S_{\hat{BCE}}}{S_{\hat{BDE}}} = \frac{BC}{DE}$ $\quad \left.\begin{matrix}\hat{A}=\hat{A}\\ \hat{C}=\hat{E}_1\end{matrix}\right\} \xrightarrow{zz} A\hat{D}E \sim A\hat{B}C$ $\quad \frac{BC}{DE} = \frac{AB}{AD} = \frac{12}{5} = 2,4$

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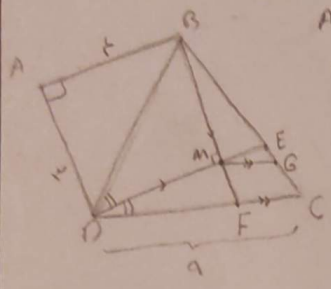

$ABDM \rightarrow$ مستطیل $\Rightarrow BM = 3$, $DM = 4$

$\left.\begin{matrix}B\hat{M}D = D\hat{M}F\\ E\hat{D}C = B\hat{D}E\\ MD = MD\end{matrix}\right\} \xrightarrow{\text{زض}} B\hat{D}M \cong D\hat{M}F \Rightarrow BM = MF = 3$

$\Rightarrow DF = \sqrt{4^2+4^2} = 4\sqrt{2}$ $\quad DC=9 \Rightarrow FC = 9-5 = 4$

$MG \parallel FC \Rightarrow B\hat{M}G \sim B\hat{F}C$ $\quad \frac{BM}{BF} = \frac{BG}{BC} = \frac{1}{2} \Rightarrow$ G وسط BC است.

$\frac{MG}{FC} = \frac{1}{2}$ $\quad \frac{MG}{4} = \frac{1}{2}$ $\quad MG = 2$

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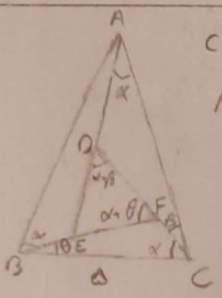


$C\hat{A}D = A\hat{B}F = B\hat{C}D = \alpha$ $\quad D\hat{C}A = \beta$ $\quad F\hat{B}C = \theta$

$A\hat{D}C : D\hat{C}A = \beta$ $\quad D\hat{A}C = \alpha$ $\xrightarrow{\text{مجموع زوایای } EDF}$ $E\hat{D}F = D\hat{A}C + D\hat{C}A = \alpha+\beta$

$B\hat{F}C : F\hat{B}C = \theta$ $\quad D\hat{C}B = \alpha$ $\xrightarrow{\text{مجموع زوایای } DFE}$ $D\hat{F}E = F\hat{B}C + D\hat{C}B = \alpha+\theta$

$\left.\begin{matrix}A\hat{C}B = E\hat{D}F = \alpha+\beta\\ A\hat{B}C = D\hat{F}E = \alpha+\theta\end{matrix}\right\} \xrightarrow{zz} A\hat{B}C \sim E\hat{F}D$ $\quad \frac{BC}{FD} = \frac{AB}{EF}$ $\quad \frac{8}{2,5} = \frac{AB}{3}$

$AB = \frac{24}{2,5} = 9,6$

۴

$DC = a$ $\quad \left.\begin{matrix}B\hat{C}M = A\hat{M}F\\ \hat{A} = \hat{B} = 90^\circ\end{matrix}\right\} \xrightarrow{zz} A\hat{M}F \sim B\hat{C}M$ $\quad \frac{AM}{BC} = \frac{AF}{BM} = \frac{MF}{MC} = \frac{1}{2}$

$MC = \sqrt{BM^2+CB^2} = \sqrt{\frac{a^2}{4}+a^2} = \frac{\sqrt{5}}{2}a$ $\quad \frac{MF}{\frac{\sqrt{5}}{2}a} = \frac{1}{2}$ $\quad MF = \frac{\sqrt{5}}{4}a$

$\left.\begin{matrix}D\hat{E}C = M\hat{E}B\\ C\hat{D}E = E\hat{B}M\end{matrix}\right\} \xrightarrow{zz} D\hat{C}E \sim B\hat{M}E$ $\quad \frac{DC}{BM} = \frac{DE}{BE} = \frac{CE}{ME} = \frac{1}{2}$ $\quad \frac{CE}{ME} = \frac{1}{2}$ $\quad \frac{MC}{ME} = \frac{3}{5}$ $\quad ME = \frac{2}{3}\cdot\frac{\sqrt{5}}{2}a = \frac{\sqrt{5}}{3}a$

$S_{\hat{EMF}} = \frac{MF \times ME}{2} = \frac{\frac{\sqrt{5}}{4}a \times \frac{\sqrt{5}}{3}a}{2} = \frac{\frac{5}{12}a^2}{2} = \frac{15}{4} = 3,75$

۵

$D\hat{A}E = A\hat{C}B = \alpha$ $\quad A\hat{C}D : C\hat{A}D = \beta \xrightarrow{\text{مجموع زوایای } ADE} A\hat{D}E = C\hat{A}D + A\hat{C}B = \alpha+\beta$

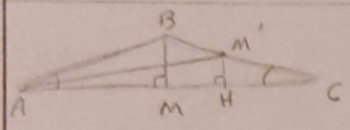
$\left.\begin{matrix}A\hat{D}E = C\hat{A}E = \alpha+\beta\\ D\hat{A}E = A\hat{C}E = \alpha\end{matrix}\right\} \xrightarrow{zz} A\hat{D}E \sim C\hat{A}E$ $\quad \frac{AE}{CE} = \frac{DE}{AE}$ $\quad \frac{AE}{x+10} = \frac{10}{AE}$ $\quad AE^2 = 10x+100$

$AE^2 = AB^2 + BE^2 = 121 + x^2 = 10x+100$ $\quad x^2-10x+21 = 0$ $\quad (x-7)(x-3) = 0$

$x = 7$ $\quad x = 3$

$EF^2 = DF \times FC \quad 4^2 = 1 \times FC \quad FC = 14 \quad BC^2 = CF \times AC \quad BC^2 = 14 \times 20$

$\Rightarrow BC = 8\sqrt{3}$ ۶

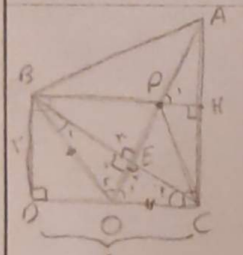


$BM = 8$
$CM = \frac{AC}{2} = 8$ $\Big\}$ $BC = \sqrt{BM^2 + CM^2} = 8\sqrt{2}$ $S_{ABC} = \frac{BM \times AC}{2} = \frac{8 \times 14}{2} = 56$

$S_{AM'C} = \frac{S_{ABC}}{2} = \frac{56}{2} = 28 = \frac{M'H \times AC}{2}$ $M'H = \frac{28 \times 2}{14} = 4$

$M'C = \frac{BC}{2} = 4\sqrt{2}$ $HC = \sqrt{(CM')^2 - (HM')^2} = \sqrt{32 - 16} = 4$ $AH = 14 - CH = 14 - 4 = 10$

$AM' = \sqrt{AH^2 + M'H^2} = \sqrt{100 + 16} = \sqrt{140} = 4\sqrt{10}$ ۷



$\hat{B}_1 = \hat{C}_1$
$\hat{E}_1 = \hat{E}_2 = 90°$ $\Big\}$ $\Rightarrow \hat{O}_1 = \hat{O}_2$ $\hat{O}_1 = \hat{O}_2$
$OB = OC$ $\Big\}$ (زاویه) $\Rightarrow B\hat{E}O \cong C\hat{E}O \rightsquigarrow BE = CE = \frac{1}{2}BC$
$\hat{B}_1 = \hat{C}_1$

$BC = \sqrt{BD^2 + CD^2} = \sqrt{4 + 14} = 2\sqrt{3} \Rightarrow BE = \sqrt{3}$

$BO^2 = BD^2 + OD^2$ $OB = x$ $x^2 = 4 + 14 - 8x + x^2$ $x = 2,3 \Rightarrow OD = 1,3$

$OE = PE$
$BE = CE$ $\Big\}$ (زاویه) $\Rightarrow B\hat{P}E \cong O\hat{B}E \Rightarrow BP = OP$ (مساحت) $\Rightarrow OC = PC \rightsquigarrow OBPC$ (ذوزنقه)

$\hat{E}_1 = \hat{E}_2$

$BP \parallel OC \quad BD \perp OC \Rightarrow BP \perp BD \Rightarrow BH \perp AC \Rightarrow BDCH$ (مستطیل) $\Rightarrow PH = 1,3 \Rightarrow CH = 2$

$\hat{O}_1 = \hat{P}_1$
$\hat{A} = \hat{A}$ $\Big\}$ $\Rightarrow A\hat{C}O \sim A\hat{H}P$ $\frac{AH}{AC} = \frac{PH}{CO} = \frac{1,3}{5,3}$ $\frac{AH}{2CH} = \frac{1,3}{1}$ $AH = 2$ $AC = 3$ $AE = \sqrt{2^2 - 1^2} = 2\sqrt{3}$

$S_{ABE} = \frac{AE \times BE}{2} = \frac{2\sqrt{3} \times \sqrt{3}}{2} = 3$ ۸

$AB = \sqrt{BC^2 + AC^2} = \sqrt{81 + 9} = 3\sqrt{10}$ $S_{ABC} = \frac{AC \times BC}{2} = \frac{OC \times AB}{2}$ $OC = \frac{AC \times BC}{AB} = \frac{3 \times 9}{3\sqrt{10}} = \frac{9}{\sqrt{10}}$

$AD = \sqrt{AC^2 - OC^2} = \sqrt{9 - \frac{81}{10}} = \frac{3}{\sqrt{10}}$

$\hat{B} = \hat{B}$
$\hat{C} = \hat{E} = 90°$ $\Big\}$ $\Rightarrow A\hat{B}C \sim D\hat{B}E$ $\frac{AB}{DB} = \frac{BC}{BE}$

$\frac{3\sqrt{10}}{3\sqrt{10} - \frac{3}{\sqrt{10}}} = \frac{9}{BE}$ $\frac{\frac{30}{\sqrt{10}}}{\frac{30 - 3}{\sqrt{10}}} = \frac{9}{BE}$ $BE = \frac{9 \times 27}{30} = 8,1$ ۹

$AC = \sqrt{AB^2 + BC^2} = \sqrt{144 + 256} = \sqrt{400} = 20$ $AB^2 = AH \times AC$ $AH = \frac{14 \times 14}{20} = \frac{49}{5} = 9,8$

$\Rightarrow AE = \frac{32}{5}$
$\hat{A} = \hat{A}$
$\hat{D} = \hat{H}$ $\Big\}$ $\Rightarrow A\hat{D}E \sim A\hat{H}B \Rightarrow \frac{AE}{AB} = \frac{DF}{BH} = \frac{2}{5}$

$BH^2 = AH \times CH = \frac{49}{5} \times \left(\frac{100}{5} - \frac{49}{5}\right)$ $BH = \frac{7 \times 9}{5} = \frac{63}{5}$ $\frac{DF}{\frac{63}{5}} = \frac{2}{5}$

$DF = \frac{2}{5} \times \frac{63}{5} = \frac{126}{25} = 5,04$ ۱۰