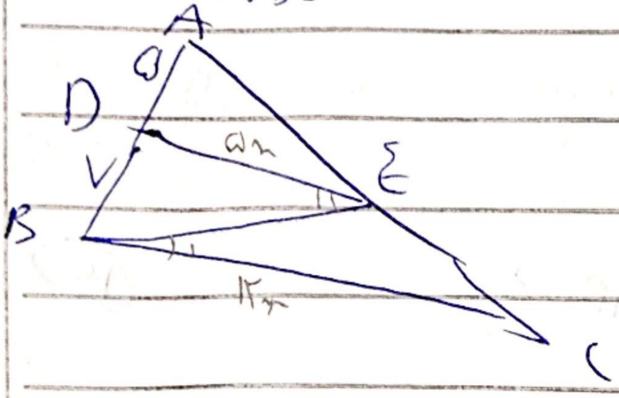
تکلیف شماره ۲۲ — تاریخ دهم دفتر A — ۲۰ — نمره مدرس

(۱)

$$\frac{S_{BCE}}{S_{BDE}} =$$

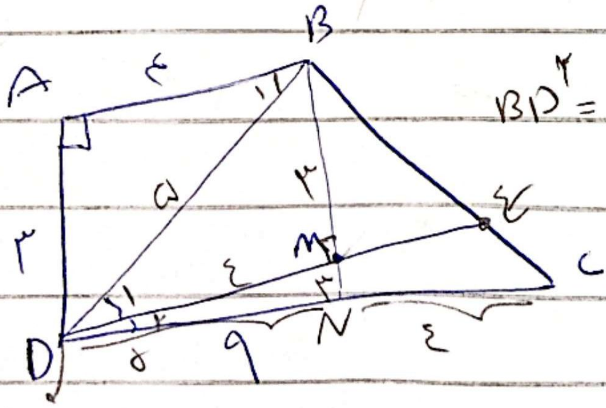


$DE \parallel BC,\ BE \Rightarrow \hat{E}_1 = \hat{B}_1$

$$\frac{DE}{BC} = \frac{5}{12} = \frac{AD}{AB}$$

$$\frac{S_{BCE}}{S_{BDE}} = \frac{\frac{1}{2} \times BE \times BC \times \sin B_1}{\frac{1}{2} \times DE \times BE \times \sin E_1} = \frac{12}{5}$$

(۲)



$BD^2 = 3^2 + 4^2 - BD = 5$

$BD = DN = 5$

$NC = 4$

DM نیمساز

$AB \parallel DC,\ BD \Rightarrow \hat{B}_1 = \hat{D}_1 = \hat{D}_2$

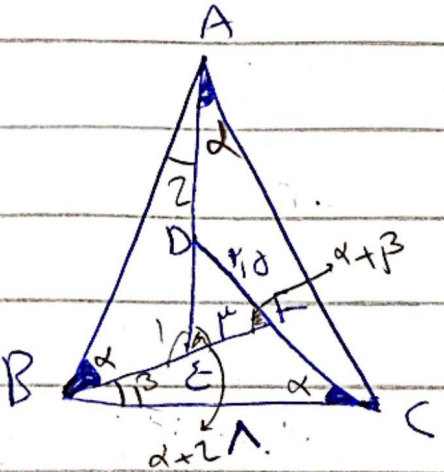
BD مشترک، $\hat{B}_1 = \hat{D}_1$ $\Big\}$ $\overset{\triangle}{ABD} \cong \overset{\triangle}{BMD} \Rightarrow M = 90^\circ$

DM مشترک، $\hat{D}_1 = \hat{D}_2$ $\Big\}$ $\rightarrow$ $\overset{\triangle}{BDM} \cong \overset{\triangle}{DMN} \Rightarrow$ $DN = 5 \Rightarrow MN = BM = 3$

$NC \parallel ME \Leftrightarrow \begin{cases} BE = EC \\ MN = BM \end{cases}$

$\Rightarrow \frac{ME}{NC} = \frac{BE}{BC} = \frac{BM}{BN} = \frac{1}{2}$

$\frac{3}{4} = \frac{MN}{6} \rightarrow MN = \frac{18}{4.5} = 4$ (۲) بدیهی

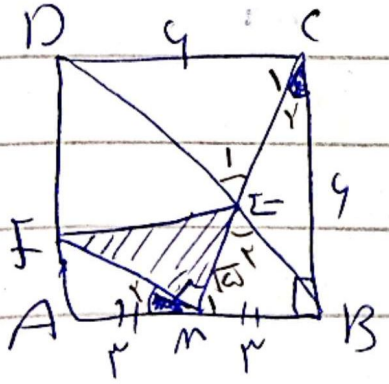


(۳)

$AB = ?$

$\hat{B} + \hat{E}_1 = \hat{A}_1$

$ABC \sim DEF \Rightarrow \frac{DF}{BC} = \frac{3}{AB} \rightarrow AB = \frac{8 \times 3}{2.8} = \frac{8 \times \sqrt{7} \times 2}{7} = 9.4$



(۴)

$MC^2 = 6^2 + 3^2$

$MC = \sqrt{45} = 3\sqrt{5}$

$DC \parallel AB$, $CM \Rightarrow \hat{C}_1 = \hat{M}_1$

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

$\Rightarrow \frac{DC}{MB} = \frac{CE}{ME} = \frac{6}{3} = \frac{2}{1} \rightarrow CE = 2ME$

$CE + ME = 3\sqrt{5}$, $2ME + ME = 3ME = 3\sqrt{5}$

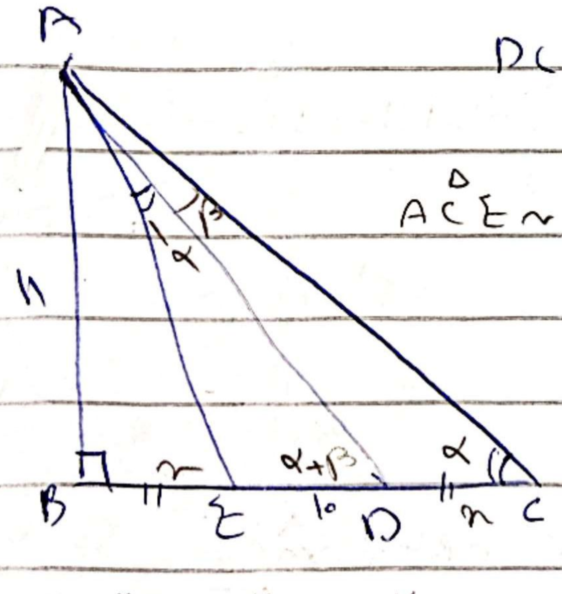
$ME = \sqrt{۵} \Rightarrow CE = ۲\sqrt{۵}$

$\left.\begin{array}{l}\hat{C}_۲ = \hat{M}_۲ \\ \hat{A} = \beta\end{array}\right\} \Rightarrow \overset{\triangle}{CMB} \sim \overset{\triangle}{AMF} \Rightarrow$

$\frac{MB}{AF} = \frac{BC}{AM} = \frac{CM}{FM}$

$\frac{۳}{AF} = \frac{۶}{۳} = \frac{۳\sqrt{۵}}{FM} \Rightarrow FM = \frac{۳ \times \sqrt{۵} \times ۳}{۶} = \frac{۳\sqrt{۵}}{۲}$

$S_{FME} = \frac{FM \times ME}{۲} = \frac{\frac{۳\sqrt{۵}}{۲} \times \sqrt{۵}}{۲} = \frac{۳ \times ۵}{۴} = \boxed{\frac{۱۵}{۴}}$



$DC = ?$ (۵)

$\overset{\triangle}{ACE} \sim \overset{\triangle}{DAE} \rightarrow \frac{AE}{EC} = \frac{ED}{AE}$

$\frac{AE}{۱۰+x} = \frac{۱۰}{AE} \rightarrow AE^۲ = ۱۰۰ + ۱۰x$

$AE^۲ = ۱۱^۲ + x^۲ = ۱۲۱ + x^۲$

$۱۰۰ + ۱۰x = ۱۲۱ + x^۲$

$AB^۲ + BE^۲ = AE^۲ \rightarrow ۱۱^۲ + x^۲ = AE^۲$

$\left\{\begin{array}{l} x = ۳ \\ x = ۷ \end{array}\right.$

$AE = \sqrt{۱۲۱ + x^۲}$

$\left.\begin{array}{l}\text{مشترک } AE \\ \hat{C} = \hat{A}_۱\end{array}\right\} \overset{\triangle}{AEC} \sim \overset{\triangle}{AED} \rightarrow \frac{ED}{AE} = \frac{AE}{EC}$

$AE^2 = ED \times EC$

$121 + x^2 = 10(10 + x)$

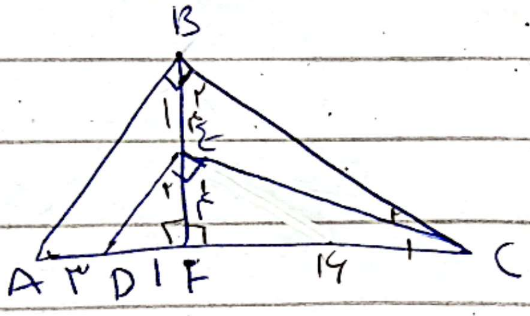
$121 + x^2 - 100 - 10x = 0$

$x^2 - 10x + 21 = 0$

$(x-3)(x-7) = 0$

$x = 7$

$x = 3$



(6)

$BC = ?$

$BC^2 = BF^2 + CF^2$

$BC^2 = 16^2 + 8^2 \rightarrow BC = \sqrt{320} = 8\sqrt{5}$ جواب

$\hat{C}_1 = \hat{E}_2$, $\hat{F}_1 = \hat{F}_2 = 90$, $\hat{D} = \hat{E}_1$ $\Big\} \rightarrow \overset{\triangle}{EFD} \sim \overset{\triangle}{EFC} \Rightarrow \dfrac{EF}{DF} = \dfrac{CF}{EF}$

(2)

$EF^2 = CF \times DF$

$16 = CF \times 1 \rightarrow CF = 16$

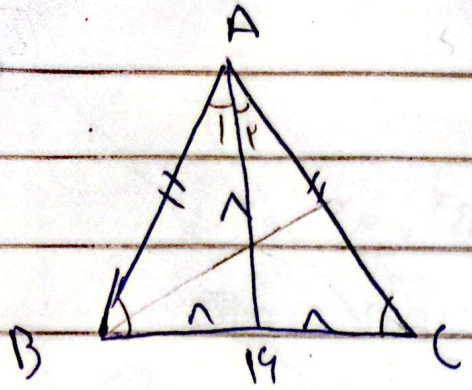
$\hat{B}_1 = \hat{C}$, $\hat{F}_1 = \hat{F}_2 = 90^\circ$, $\hat{A} = \hat{B}_2$ $\Big\}$ $\overset{\triangle}{ABF} \sim \overset{\triangle}{CBF} \rightarrow \dfrac{AF}{BF} = \dfrac{BF}{FC}$

$BF^2 = AF \times FC$

$BF^2 = 4 \times 16 \rightarrow BF = 8$

$BE = EF = 4$

(۷)



$\hat{B} = \hat{C}$

$A\hat{Y} = \hat{C}$

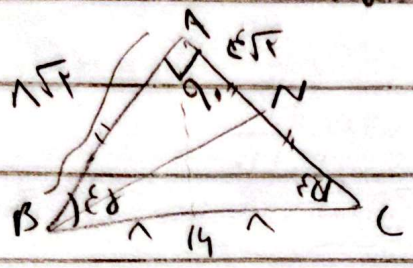
$A\hat{1} = \hat{B}$

$\Rightarrow \hat{A_1} = \hat{A_2} = \hat{B} = \hat{C}$

$\frac{۱۸۰}{۳} = ۶۰$

$\hat{B} = \hat{C} = ۶۰ \Rightarrow \hat{A} = ۶۰$

(۶)



$AC = \frac{\sqrt{۲}}{۲} \times BC = \frac{\sqrt{۲}}{۲} \times ۱۴ = ۸\sqrt{۲} = AB$

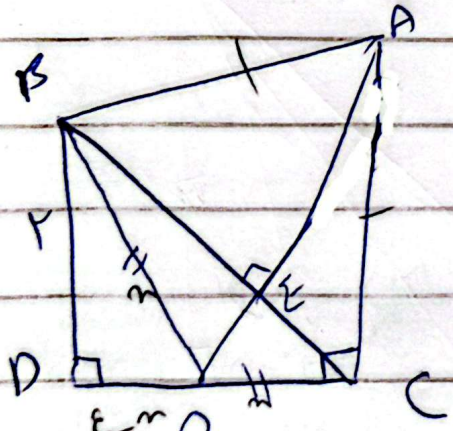
$\frac{۸\sqrt{۲}}{۲} = ۴\sqrt{۲} = AN = CN$

$AB^۲ + AN^۲ = BN^۲$

$(۸\sqrt{۲})^۲ + (۴\sqrt{۲})^۲ = BN^۲$

$۱۲۸ + ۳۲ = ۱۶۰ = BN^۲ \Rightarrow BN = ۴\sqrt{۱۰}$

(۸)



$S_{\triangle ABE} = ?$

$OB = OC \Rightarrow$ BC عمودمنصف AD

$m^۲ = ۲^۲ + (۴-m)^۲$

$m^۲ = ۴ + ۱۶ - ۸m + m^۲$

$۸m = ۲۰ \rightarrow m = \frac{۲۰}{۸} = ۲/۵$

$BC^۲ = ۲^۲ + ۴^۲ = ۲۰ \rightarrow BC = ۲\sqrt{۵}$

$BE = EC = \sqrt{۵}$

$BO^۲ = BE^۲ - EO^۲ \rightarrow (۲/۵)^۲ = (\sqrt{۵})^۲ - EO^۲ \rightarrow EO^۲ = ۱/۲۵ \rightarrow EO = \sqrt{\frac{۱۲۵}{۱۰۰}} = \frac{\sqrt{۵}}{۲}$

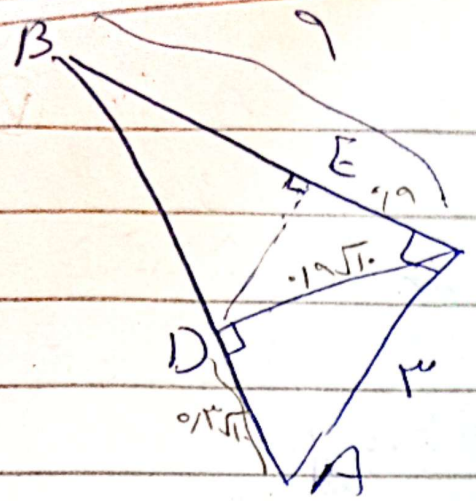
ادامه ۸) $\triangle ACD \cong \triangle ABD \Rightarrow \hat{ABD} = \hat{ACD} = 90$

$BE^2 = AE \times ED \to (\sqrt{5})^2 = AE \times \frac{\sqrt{5}}{2}$

$AE = 2\sqrt{5}$

$S_{ABE} = \frac{1}{2} \times AE \times BE = \frac{1}{2} \times 2\sqrt{5} \times \sqrt{5} = \boxed{5}$

جواب



(۹)

$BE = ?$

$AB^2 = 9^2 + 3^2$

$AB = 3\sqrt{10}$

$AC^2 = AD \times AB$

$9 = AD \times 3\sqrt{10}$

$AD = \frac{9}{3\sqrt{10}} = \frac{3}{\sqrt{10}} = 0/3\sqrt{10}$ (۳)

$DC^2 + AD^2 = AC^2$

$DC^2 + \frac{9 \times 1}{10} = 9$

$DC^2 = 9 - 0/9 = 8/1$

$DC = \frac{9}{\sqrt{10}} = \frac{9\sqrt{10}}{10}$

$CD^2 = EC \times BC$

$\frac{81 \times 1}{10} = EC \times 9$

$8/1 = EC \times 9 \rightarrow EC = \frac{8/1}{9} = 0/9$

$ED^2 = \frac{81 \times 1}{10} - \frac{81}{100} = \frac{810 - 81}{100} = \frac{729}{100}$

$ED = 2/7$

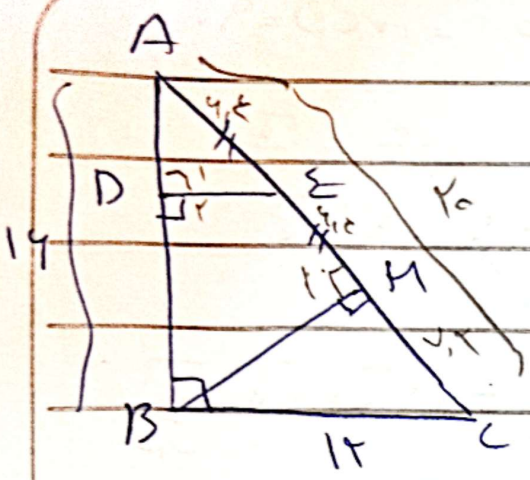
$ED^2 = BE \times EC$

$\frac{729}{100} = BE \times \frac{9}{10} \rightarrow BE = \frac{729 \times 10}{100 \times 9} = \frac{81}{30}$

$BE = 8/1$

تاریخ: / /

(۱۰)



$DE = ?$

$AB^2 + BC^2 = AC^2$

$12^2 + 14^2 = 400$

$AC = 20$

(۲)

$DE \parallel BC \rightarrow \frac{AD}{AB} = \frac{DE}{BC} \rightarrow \frac{9.6}{14} = \frac{DE}{12} \Rightarrow DE = 8.23$

جواب

$\hat{C} = \hat{C}$

$\hat{M} = \hat{B} = 90$ $\Big\}$ $ABC \sim BMC \Rightarrow \frac{BM}{AB} = \frac{CM}{BC} = \frac{BC}{AC}$

$\frac{BM}{14} = \frac{CM}{12} = \frac{12}{20}$

$CM = \frac{144}{20} = 7.2$

$25 = 7.2 + 2m \rightarrow 2m = 17.8$

$x = 9.6$

$\hat{A} = \hat{A}$

$\hat{M}_1 = \hat{D}_1 = 90$ $\Big\}$ $ADE \sim AMB \Rightarrow \frac{BM}{DE} = \frac{AB}{AE} = \frac{AM}{AD}$

$\frac{BM}{DE} = \frac{14}{9.6} = \frac{17.8}{AD}$

$AD = 12.7$