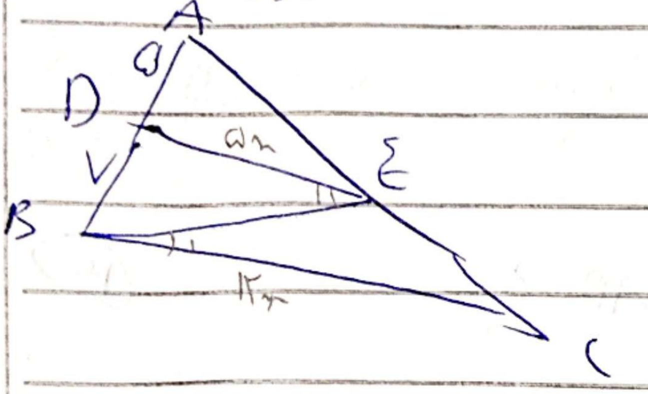
تکلیف شماره ۲۲ — یازدهم دفتر A — هادی مدلل

(۱)

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

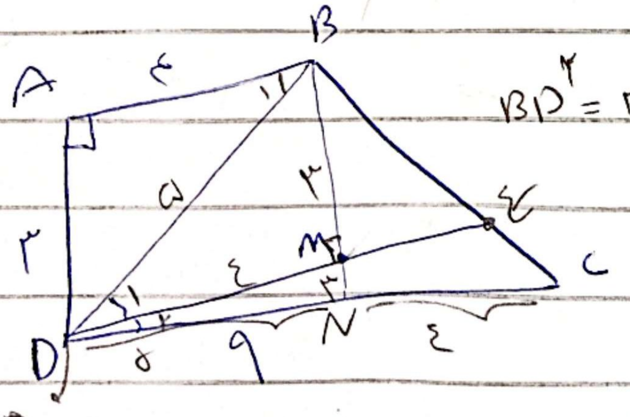


$DE \parallel BC$, BE مورب $\Rightarrow \hat{E}_1 = \hat{B}_1$

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

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

(۲)



$BD^2 = 3^2 + 4^2 \rightarrow BD = 5$

$BD = DN = 5$

$NC = 4$

DM نیمساز

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

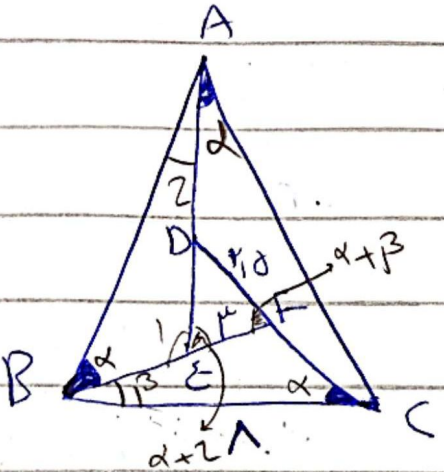
BD مشترک
$\hat{B}_1 = \hat{D}_1$
$\Big\} \overset{\Delta}{ABD} \cong \overset{\Delta}{BMD} \Rightarrow M = 90^\circ$

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

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

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

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

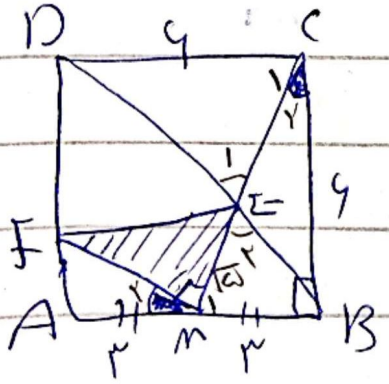


(۳)

$AB = ?$

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

$ABC \sim DEF \Rightarrow \frac{DF}{BC} = \frac{3}{AB} \rightarrow AB = \frac{8 \times 3}{2.5} = \frac{8 \times \sqrt{5} \times 3}{5} = 9.4$



(۴)

$MC^2 = 4^2 + 3^2$

$MC = \sqrt{25} = 5\sqrt{5}$

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

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

$\Rightarrow \frac{DC}{MB} = \frac{CE}{ME} = \frac{4}{3} = \frac{2}{1} \rightarrow CE = 2ME$

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

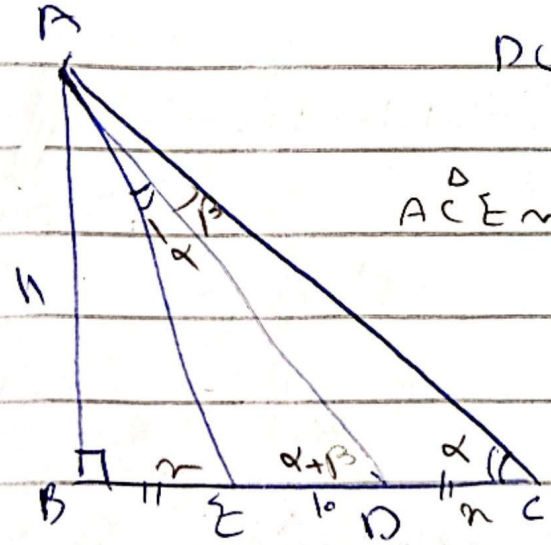
$ME = \sqrt{5} \Rightarrow CE = 2\sqrt{5}$

$\hat{C}_1 = \hat{M}_1$, $\hat{A} = \beta$ $\Rightarrow \overset{\Delta}{CMB} \sim \overset{\Delta}{AMF} \Rightarrow$

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

$$\frac{2}{AF} = \frac{4}{2} = \frac{2\sqrt{5}}{FM} \Rightarrow FM = \frac{2 \times \sqrt{5} \times 2}{4} = \frac{2\sqrt{5}}{2}$$

$$S_{FME} = \frac{FM \times ME}{2} = \frac{\frac{2\sqrt{5}}{2} \times \sqrt{5}}{2} = \frac{2 \times 5}{4} = \frac{10}{4}$$



$DC = ?$ (5)

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

$\frac{AE}{10+x} = \frac{10}{AE} \rightarrow AE^2 = 100 + 10x$

$AE^2 = 11^2 + x^2 = 121 + x^2$

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

$AB^2 + BE^2 = AE^2 \rightarrow 11^2 + x^2 = AE^2$

$AE = \sqrt{121 + x^2}$

$x = 2$ or $x = 7$

مشترک AE

$\hat{C} = \hat{A}_1$ $\overset{\Delta}{AEC} \sim \overset{\Delta}{AED} \rightarrow \frac{ED}{AE} = \frac{AE}{EC}$

$AE^2 = ED \times EC$

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

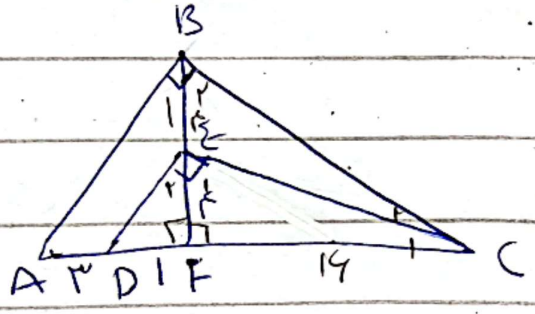
$121 + x^2 = 100 - 10x = 0$

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

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

$\rightarrow x = 7$

$\rightarrow x = 3$



$BC = ?$ (۴)

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

$BC^2 = 14^2 + 8^2 \rightarrow BC = \sqrt{260} = 8\sqrt{5}$

جواب

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

$\hat{F}_1 = \hat{F}_2 = 90$

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

$\left.\begin{array}{l}\\ \\ \\ \end{array}\right\} \triangle EFD \sim \triangle EFC \Rightarrow \frac{EF}{DF} = \frac{CF}{EF}$

$EF^2 = CF \times DF$

$14 = CF \times 1 \rightarrow CF = 14$

$\hat{B}_1 = \hat{C}$

$\hat{F}_1 = \hat{F}_2 = 90^\circ$

$\hat{A} = \hat{B}_2$

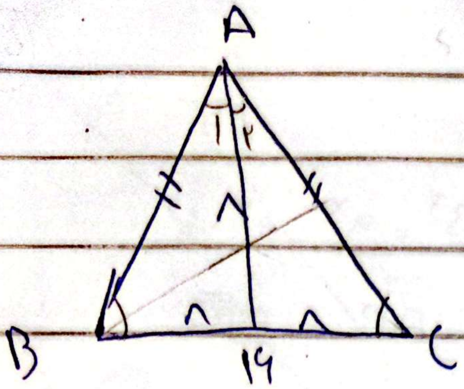
$\left.\begin{array}{l}\\ \\ \\ \end{array}\right\} \triangle ABF \sim \triangle CBF \rightarrow \frac{AF}{BF} = \frac{BF}{FC}$

$BF^2 = AF \times FC$

$BF^2 = 4 \times 14 \rightarrow BF = 8$

$BE = EF = 4$

(7)



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

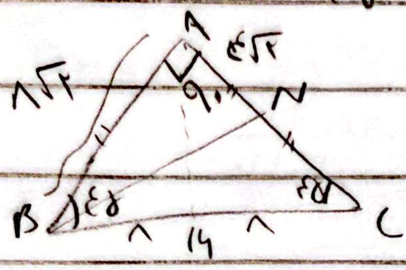
$\hat{A}_2 = \hat{C}$

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

$\Rightarrow \hat{A}_1 = \hat{A}_2 = \hat{B} = \hat{C}$

$\frac{180}{4} = 45^\circ$

$\hat{B} = \hat{C} = 45^\circ \Rightarrow \hat{A} = 90^\circ$



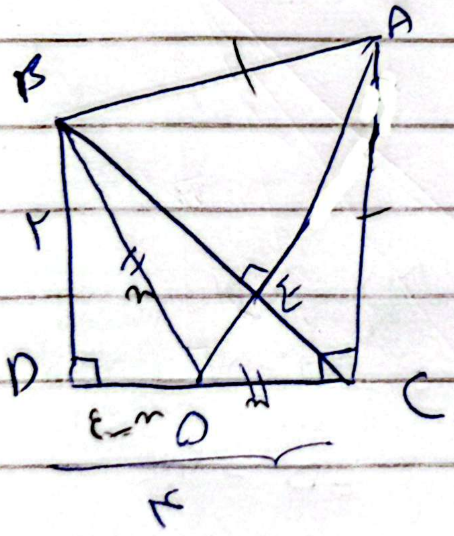
$AC = \frac{\sqrt{2}}{2} \times BC = \frac{\sqrt{2}}{2} \times 16 = 8\sqrt{2} = AB$

$\frac{8\sqrt{2}}{2} = 4\sqrt{2} = AN = CN$

$AB^2 + AN^2 = BN^2$

$(8\sqrt{2})^2 + (4\sqrt{2})^2 = BN^2$

$128 + 32 = 160 = BN^2 \Rightarrow BN = 4\sqrt{10}$



(8)

$S_{\overset{\triangle}{ABE}} = ?$

$OB = OC \Rightarrow$ عمودمنصف BC ، AD

$x^2 = 2^2 + (4-x)^2$

$x^2 = 4 + 16 - 8x + x^2$

$8x = 20 \rightarrow x = \frac{20}{8} = 2.5$

$BC^2 = 2^2 + 4^2 = 20 \rightarrow BC = 2\sqrt{5}$

$BE = EC = \sqrt{5}$

$BO^2 = BE^2 + EO^2 \rightarrow (2.5)^2 = \sqrt{5}^2 + EO^2 \rightarrow EO^2 = 1.25 \rightarrow EO = \sqrt{\frac{125}{100}} = \frac{\sqrt{5}}{2}$

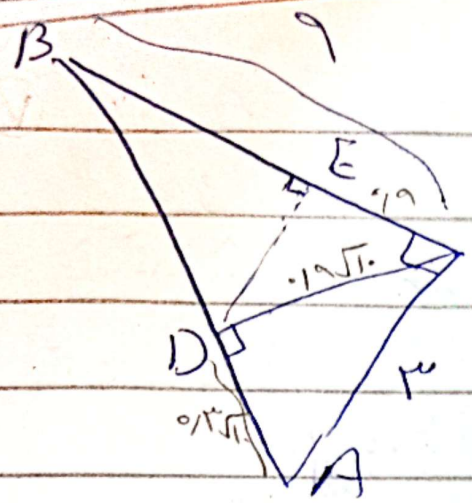
موضوع: _____ تاریخ: / /

$\triangle AC O \cong \triangle AB O \Rightarrow \hat{ABO} = \hat{ACD} = 90^\circ$ (زاویه ۸)

$BE^2 = AE \times EO \rightarrow (\sqrt{5})^2 = AE \times \frac{\sqrt{5}}{2}$

$AE = 2\sqrt{5}$

$S_{ABCE} = \frac{1}{2} \times AE \times BE = \frac{1}{2} \times 2\sqrt{5} \times \sqrt{5} = 5$ مجذور



(9)

$BE = ?$

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

$AB = 3\sqrt{10}$

$AC^2 = AD \times AB$

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

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

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

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

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

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

$CD^2 = EC \times BC$

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

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

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

$ED = 2/7$

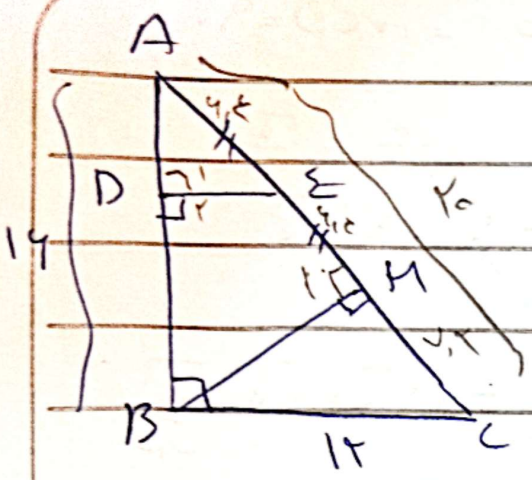
$ED^2 = BE \times EC$

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

$BE = 8/1$

تاریخ: / /

(۱۰)



$DE = ?$

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

$12^2 + 16^2 = 400$

$AC = 20$

$DE \parallel BC \rightarrow \frac{AD}{AB} = \frac{DE}{BC} \rightarrow \frac{9.6}{AD} = \frac{DE}{12} \Rightarrow DE = 11.52$

جواب

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

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

$\frac{BM}{16} = \frac{CM}{12} = \frac{12}{20}$

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

$20 = 7.2 + 2m \rightarrow 2m = 12.8$

$x = 9.6$

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

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

$\frac{BM}{DE} = \frac{16}{9.6} = \frac{12.8}{AD}$

$AD = 9.6$