[illegible] C　　　　تکلیف ۳۲　　　　[illegible]

$AE = 5x \quad EC = 7x$

$DE \parallel BC \rightarrow \frac{AD}{DB} = \frac{AE}{EC} = \frac{5}{7} \qquad \frac{S_{\triangle BDE}}{S_{\triangle ADE}} = \frac{\frac{1}{2} BD \times EH'}{\frac{1}{2} AD \times EH'} = \frac{7}{5} \qquad \frac{S_{ADE}}{S_{ECB}} = \frac{\frac{1}{2} AE \times BH}{\frac{1}{2} EC \times BH} = \frac{5}{7} \rightarrow \frac{12S}{S_{ECB}} = \frac{5}{7}$ ①

$S_{BDE} = 7S \quad S_{DAE} = 5S \qquad S_{ECB} = \frac{84}{5} S$

$\frac{S_{BCE}}{S_{BDE}} = \frac{12}{5} S$

---

②

$2\hat{BDM} = \hat{BDC} \rightarrow \hat{BDM} = \hat{MDC} \qquad \triangle A\hat{B}D \cong \triangle B\hat{M}D \rightarrow BM = 2AD, \; AB = DM = 4$

براساس نقض

$MN \parallel OC \rightarrow \frac{BM}{MO} = \frac{BN}{NC} = \frac{2}{2} = 1$ [illegible] $\frac{BM}{BO} = \frac{MN}{OC} = \frac{2}{3} = \frac{MN}{4} \rightarrow MN =$ [illegible]

$\triangle ABC \sim \triangle DEF \rightarrow \frac{AB}{3} = \frac{8}{2.5} \rightarrow AB = \frac{24}{2.5} = 9.6$ ③

$\begin{cases} \hat{BMC} \sim \hat{AMF} \rightarrow AF = \frac{3}{2} \\ BME \sim CDM \rightarrow ME = \frac{1}{2} CE \end{cases} \qquad MC = \sqrt{6^2 + 3^2} = 3\sqrt{5}$ ④

$ME = \frac{1}{2} CE \rightarrow \begin{cases} ME = \sqrt{5} \\ CE = 2\sqrt{5} \end{cases}$

فیثاغورس $MF = \sqrt{\left(\frac{3}{2}\right)^2 + 3^2} = \frac{3}{2}\sqrt{5}$

$S_{MEF} = \frac{1}{2}\left(\frac{3}{2}\sqrt{5}\right)(\sqrt{5}) = \frac{5 \times 3}{4} = 3.75$

$\frac{x}{10 + x} = \frac{y}{z} = \frac{10}{x} \rightarrow x^2 = 10(10 + x) \rightarrow 121 + m^2 = 100 + 10m, \; m^2 - 10m + 21 = 0$ ⑤

$(m - 7)(m - 3) = 0 \rightarrow m = 3, \; m = 7$

$EF^2 = DF \times FC \rightarrow 16 = 1 \times FC \rightarrow FC = 16 \rightarrow AC = 3 + 16 + 1 = 20$ ⑥

ارتفاع BF در BAC $\rightarrow FC \times AC = BC^2 \rightarrow 16 \times 20 = BC^2 \rightarrow BC = 8\sqrt{5}$

⑦

$\sqrt{۸^۲+۸^۲}=\sqrt{۱۲۸}=۸\sqrt{۲}$ → $m_b=\frac{۱}{۲}\sqrt{۲a^۲+۲c^۲-b^۲}$ قاعده $a=۱۴$

طول هر ساق میانه نسبت به ضلع b ساق ها $b=c=۸\sqrt{۲}$

$$m_b=\frac{۱}{۲}\sqrt{۲(۱۴^۲)+۲(۸\sqrt{۲})^۲-(۸\sqrt{۲})^۲}=\frac{۱}{۲}\sqrt{۶۴۰}\to\frac{۱}{۲}(۸\sqrt{۱۰})=۴\sqrt{۱۰}$$

$S_{EBA}=\frac{۱}{۲}\times EB\times EA=\frac{۱۰}{\sqrt{۵}}\times\sqrt{۵}\times\frac{۱}{۲}=\boxed{۵}$

⑧

$OC=BO\to O\hat{B}E=O\hat{E}C$, OE مشترک, $\hat{E}_۱=\hat{E}_۲=۹۰$ } $\overset{\triangle}{BOE}\cong EOC\to EB=EC$

$BD^۲+DC^۲=BC^۲$

$۴+۱۶=۲۰\to BE=۲\sqrt{۵}$

$EB=EC=\sqrt{۵}$

A روی عمود منصف BC $\Longleftrightarrow$ $AB=AC$, $AE=AE$, $BE=EC$ } $\xrightarrow{\text{ض ض ض}}$ $A\overset{\triangle}{B}E\cong ACE\to\hat{A}_۱=\hat{A}_۲\longrightarrow O\hat{A}C=O\hat{B}A$

$BDO\to(۴-x)^۲+۴=x^۲\to۱۶+\cancel{x^۲}-۸x+۴=\cancel{x^۲}\to x=\frac{۵}{۲}$ $BE^۲=EO\times AE\to۵=\frac{\sqrt{۵}}{۲}\times EA\to$ $EA=\frac{۱۰}{\sqrt{۵}}$

---

⑨

$\tan\alpha=\frac{۳}{۹}=\frac{۱}{۳}\to\cos\alpha=\frac{۳}{\sqrt{۱۰}}$ $BE=BC\times\frac{BD}{BC}\times\frac{BE}{BD}\to۹\times\frac{۳}{\sqrt{۱۰}}\times\frac{۳}{\sqrt{۱۰}}=\frac{۸۱}{۱۰}=۸/۱$

---

⑩

$AC^۲=AB^۲+BC^۲=۱۴۴+۲۵۶=۴۰۰\to AC=۲۰$ $\underset{\text{ارتفاع}}{BH}$, $BC^۲=HC\times AC\to\underbrace{۱۴۴=HC\times۲۰}$

$HC=۷/۲$

$AH=\underbrace{۲۰-۷/۲}_{۱۲/۸}$

$EH=AE=\frac{۱}{۲}AH=۶/۴$ $DE\parallel BC\to\frac{DE}{BC}=\frac{AE}{AC}\to\frac{DE}{\cancel{۱۲}\,۳}=\frac{۶/۴}{\cancel{۲۰}\,۵}$

$DE=۳/۸۴$