نیوشا ...   ۲۰   تکلیف ۲۲   یازدهم تجربی C

①

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

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

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

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

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②

$2B\hat{D}M = B\hat{D}C \rightarrow B\hat{D}M = M\hat{D}C \qquad A\hat{B}D \cong B\hat{M}D \rightarrow BM = 2AD$

براساس (ض ز ض) $\qquad AB = DM = 4$

$MN \parallel OC \rightarrow \frac{BM}{MO} = \frac{BN}{NC} = \frac{3}{3} = 1$ ، MN پاره خط ... BC ... $\quad \frac{BM}{BO} = \frac{MN}{OC} = \frac{3}{6} = \frac{MN}{4} \rightarrow MN = 2$

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③

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

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④

$\begin{cases} B\hat{M}C \sim A\hat{M}F \rightarrow AF = \frac{3}{2} \\ BME \sim CDM \rightarrow ME = \frac{1}{2} CE \end{cases} \qquad MC = \sqrt{6^2 + 3^2} = 3\sqrt{5}$

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

از طرفی $MF = \sqrt{(\frac{3}{2})^2 + 3^2} = \frac{3}{2}\sqrt{5}$

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

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⑤

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

$(m-7)(m-3) = 0 \rightarrow \begin{matrix} m = 3 \\ m = 7 \end{matrix}$

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⑥

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

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

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⑦

$\sqrt{8^2+8^2}=\sqrt{128}=8\sqrt{2}$ (طول هر ساق) $\rightarrow m_b=\frac{1}{2}\sqrt{2a^2+2c^2-b^2}$ (میانه نسبت به ضلع b)   قاعده $a=16$، ساق‌ها $b=c=8\sqrt{2}$

$m_b=\frac{1}{2}\sqrt{2(16^2)+2(8\sqrt{2})^2-(8\sqrt{2})^2}=\frac{1}{2}\sqrt{640}\rightarrow\frac{1}{2}(8\sqrt{10})=4\sqrt{10}$

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⑧

$OC=BO\rightarrow O\hat{B}E=O\hat{E}C$, $\hat{=} OE$, $\hat{E}_1=\hat{E}_2=90$ } $B\hat{O}E\cong E\hat{O}C\rightarrow EB=EC$ $BD^2+DC^2=BC^2$, $4+16=20\rightarrow BE=2\sqrt{5}$, $EB=EC=\sqrt{5}$

A روی عمودمنصف BC $\Longleftrightarrow$ $AB=AC$, $AE=AE$, $BE=EC$ } (ض ض ض) $\rightarrow A\hat{B}E\cong ACE\rightarrow\hat{A}_1=\hat{A}_2\rightarrow O\hat{A}C=O\hat{B}A$

$BDO\rightarrow(4-x)^2+4=x^2\rightarrow 16+x^2-8x+4=x^2\rightarrow x=\frac{5}{2}$ $BE^2=EO\times AE\rightarrow 5\times\frac{\sqrt{5}}{2}\times EA\Rightarrow EA=\frac{10}{\sqrt{5}}$

$S_{EBA}=\frac{1}{2}\times EB\times EA=\frac{10}{\sqrt{5}}\times\sqrt{5}\times\frac{1}{2}=5$

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⑨

$\tan\alpha=\frac{3}{9}=\frac{1}{3}\rightarrow\cos\alpha=\frac{3}{\sqrt{10}}$ $BE=BC\times\frac{BD}{BC}\times\frac{BE}{BD}\rightarrow 9\times\frac{3}{\sqrt{10}}\times\frac{3}{\sqrt{10}}=\frac{81}{10}=8/1$

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⑩

$AC^2=AB^2+BC^2=144+256=400\rightarrow AC=20$ BH (ارتفاع) $BC^2=HC\times AC\rightarrow 144=HC\times 20$ $HC=7/2$ $AH=20-7/2=12/8$

$EH=AE=\frac{1}{2}AH=6/4$ $DE\parallel BC\rightarrow\frac{DE}{BC}=\frac{AE}{AC}\rightarrow\frac{DE}{12}=\frac{6/4}{20}$

$DE=3/84$