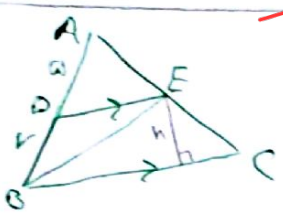
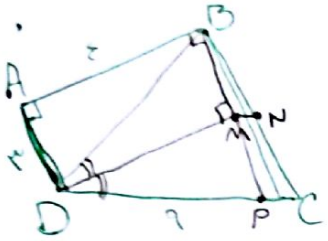
۱۱



$\frac{AD}{AB} = \frac{DE}{BC} \rightarrow \frac{۵}{۵+۷} = \frac{DE}{BC} \rightarrow \frac{DE}{BC} = \frac{۵}{۱۲}$ (۲)

$\frac{S_{BCE}}{S_{BDE}} = ?$ $\quad \frac{\frac{۱}{۲} \times h \times BC}{\frac{۱}{۲} \times h \times DE} = \frac{BC}{DE} = \frac{۱۲}{۵} = ۲,۴$ ✓

۱۲



$BD = \sqrt{۴^۲ + ۳^۲} = ۵$

$BD = DP \rightarrow DP = ۵$

$CP = DC - DP = ۹ - ۵ = ۴$

$\frac{BM}{BP} = \frac{MN}{PC} \rightarrow \frac{MN}{PC} = \frac{۱}{۲}$ (۲)

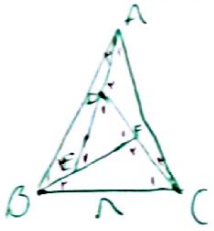
$\hat{BDC} = ۲\hat{BDM}$

BC موازی MN است؟

$MN = \frac{۱}{۲} PC = \frac{۴}{۲} = ۲$ (وسط‌ها) ✓

۱۳

$\hat{ABF} = \hat{CAE} = \hat{BCD}$ $\quad EF = ۴$ $\quad DF = ۲,۵$ (۲)



$D_۱ = A_۱ + C_۲$ $\quad A_۱ = C_۱$ $\Rightarrow D_۱ = C_۱ + C_۲$

$F_۱ = B_۱ + B_۲$

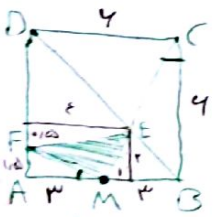
$E_۱ = A_۱ + B_۱$

$\Rightarrow \triangle DFE \sim \triangle CBA$

$\rightarrow \frac{EF}{DF} = \frac{AB}{BC} \rightarrow \frac{۴}{۲,۵} = \frac{AB}{۸}$

$AB = ?$ $\quad \frac{۴ \times ۸}{۲,۵} = ۹,۶$ ✓

۱۴



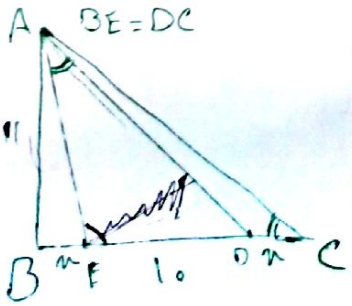
$\frac{۴-x}{x} = \frac{x}{۴-x} = \frac{۱}{۲} \Rightarrow x = ۲$ (۲)

$\hat{C} = \hat{M}$ / وسط‌ها

مساحت سایه‌ها = ؟ $\quad ۴ \times ۲ - \frac{۱ \times ۲}{۲} - \frac{۱,۵ \times ۳}{۲} - \frac{۴ \times ۰,۵}{۲} = ۳,۷۵$ ✓

۱۵

DC چقدر؟ ۳,۶



$BE = DC$

$\hat{A} = \hat{C}$, $\hat{E} = \hat{E}$ $\Rightarrow \triangle AED \sim \triangle CEA$ (۲)

$\rightarrow \frac{ED}{EA} = \frac{AE}{CE} \rightarrow \frac{۱۰}{AE} = \frac{AE}{۱۰+x}$

$\rightarrow AE^۲ = ۱۰۰ + ۱۰x$

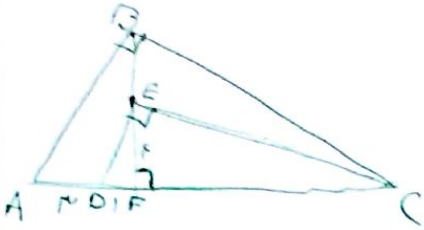
$۱۱^۲ + x^۲ = AE^۲$

$۱۰۰ + ۱۰x = AE^۲$

$x^۲ - ۱۰x + ۲۱ = ۰$

$x = \begin{cases} ۳ \\ ۷ \end{cases}$ ✓

۱۶ — (۲)



$EF^2 = DF \times CF$

$4^2 = 1 \times CF \quad CF = 16$

$BF^2 = AF \times CF$

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

$BC = ? \quad \sqrt{BF^2 + CF^2} = \sqrt{8^2 + 16^2} = 8\sqrt{5}$ ✓

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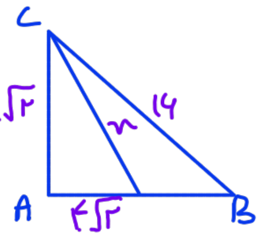
۱۷ — (۵)

$a = 8\sqrt{2}$



$a^2 + a^2 = (16)^2 \rightarrow a = 8\sqrt{2}$

$n^2 = (8\sqrt{2})^2 + (4\sqrt{2})^2 \rightarrow n = 4\sqrt{10}$

میانه نظیر هر ساق ?

میانه وارد بر وتر = نصف وتر = $\frac{8\sqrt{2}}{2}$ = ~~$4\sqrt{2}$~~

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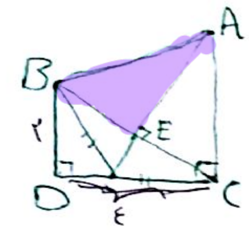
۱۸ — (۱٫۷۵)



$DM + MC = 4$, $MC = MB$ $\Big\}$ $DM + MB = 4$

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

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

$8DM = 12 \rightarrow DM = 1.5$, $BM = 2.5$

$BE = \frac{1}{2}BC = \sqrt{5}$ ✓

$BM^2 = BE^2 + ME^2 \rightarrow \frac{25}{4} = 5 + ME^2 \rightarrow ME = \frac{\sqrt{5}}{2}$

$BE^2 = ME \times AE$

$5 = \frac{\sqrt{5}}{2} \times AE \rightarrow AE = 2\sqrt{5}$ ✓

$BD = 2$

$CD = 4$

$S_{\overset{\triangle}{ABE}} = ? \ \frac{1}{2}(AE + \cancel{EM})BE = \frac{25}{4} = \cancel{\ldots}\ \frac{1}{2}AE \cdot BE = (5)$

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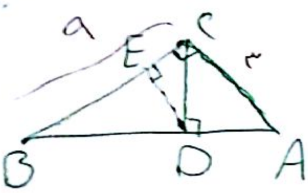
۱۹ — (۲)



$BA = \sqrt{3^2 + 9^2} = 3\sqrt{10}$

$\frac{AD}{DC} = \frac{DC}{DB} = \frac{3}{9} \rightarrow \frac{AD}{DB} = \frac{1}{9}$, $AD + DB = 3\sqrt{10}$ $\Big\}$ $AD = \frac{3\sqrt{10}}{10}$, $DB = \frac{27\sqrt{10}}{10}$

$AC = 3$

$BC = 9$

$BE = ? \quad \frac{BE}{BC} = \frac{BD}{BA} \rightarrow \frac{BE}{9} = \frac{\frac{27\sqrt{10}}{10}}{3\sqrt{10}} \rightarrow BE = 8.1$ ✓

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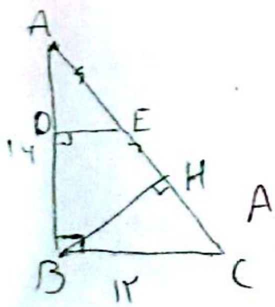
۲۰ — (۲)



$\frac{CH}{BH} = \frac{BH}{AH} = \frac{12}{16}$

$\frac{CH}{AH} = \frac{9}{16}$, $CH + AH = 20$ $\Big\}$ $CH = 7.2$, $AH = 12.8$

$AE = EH = \frac{1}{2}AH = 6.4$

$AC = \sqrt{16^2 + 12^2} = 20$

$DE = ?$

$\frac{DE}{BC} = \frac{AE}{AC} \rightarrow \frac{DE}{12} = \frac{6.4}{20} \rightarrow DE = 3.84$ ✓