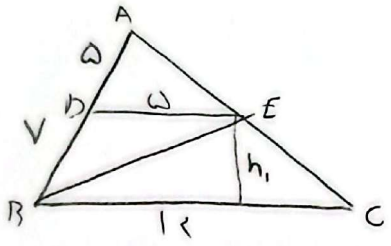
کلاس یازدهم A

۱۸٫۵

پاسخ تکلیف شماره ۲۲

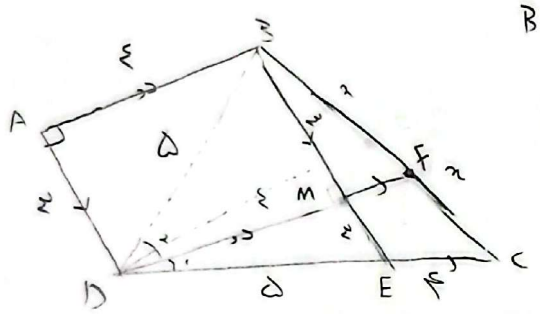
نام و نام خانوادگی: علی ربانی



۱- $DE \parallel BC \Rightarrow \hat{A}=\hat{A},\ \hat{D}=\hat{B},\ \hat{E}=\hat{C}$ (زاویه‌ها) $\Rightarrow AED \sim ABC$ (۲)

$\Rightarrow \frac{AD}{AB} = \frac{DE}{BC} = k \Rightarrow \frac{۵}{۱۲} = \frac{DE}{BC}$

$\frac{S_{BCE}}{S_{BDE}} = \frac{\frac{h_1 \times ۱۲}{۲}}{\frac{h_1 \times ۵}{۲}} = \frac{۱۲}{۵}$ ✓

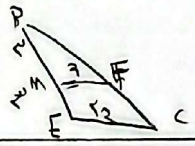


۲- $B\hat{D}C = ۲B\hat{D}M$ (۲)

$D_1 = D_2 \Rightarrow DH$ نیمساز

$\Rightarrow BM = ME = ۴$ (۲)

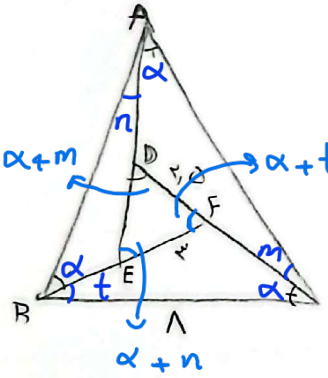
BE و M وسط BC و F



$\frac{BM}{BE} = \frac{MF}{EC} = \frac{۲}{۴} = \frac{۱}{۲}$

$\frac{۱}{۱} \times ۴ = ۴$ ✓

۳- (۰٫۵)



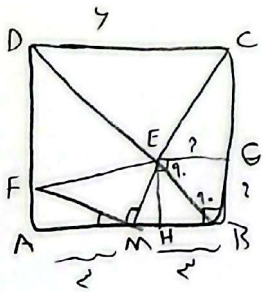
$F\hat{D}E = D\hat{A}C + A\hat{C}D = D\hat{C}B + A\hat{C}D$

$\Rightarrow D\hat{A}C = D\hat{C}B \Rightarrow BAC = DEF$

زوایای D، F و E خارجی‌اند:

$\rightarrow \hat{ABC} \sim \hat{DEF} \rightarrow \frac{AB}{۳} = \frac{۸}{۲٫۵} \rightarrow AB = 9,4$

۴- (۲)



$B\hat{C}E = AMF$, $A = B = 90$ $\Rightarrow \triangle BCM \sim \triangle AMF$

$\frac{BM}{AF} = \frac{BC}{AM} \Rightarrow \frac{۲}{AF} = \frac{۳}{۲} \Rightarrow AF = 1,5$

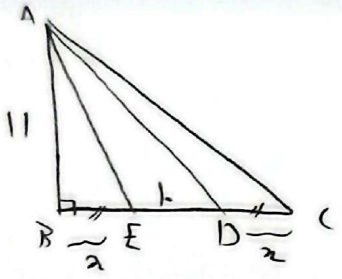
$MF^2 = AM^2 + AF^2 \Rightarrow MF^2 = ۲^2 + (1,5)^2 = ۹ + ۲,۲۵ = ۱۱,۲۵$

$MF = \sqrt{11,25} = 1,5\sqrt{5}$

$EG \parallel MB \Rightarrow \frac{CG}{BC} = \frac{EG}{MB} = \frac{۲-x}{۲} = \frac{x}{۴}$ $\quad ۴-۲x = ۲x \quad ۴x = ۴ \Rightarrow x = ۱ \Rightarrow MH = ۱$

$ME^2 = EH^2 + MH^2 = ۲^2 + ۱^2 = \sqrt{۵}$

$S_{EFM} = \frac{۱}{۲} MF \times ME = \frac{۱}{۲} \times 1,5\sqrt{5} \times \sqrt{5} = ۳,۷۵$ ✓



$BE = DC$ ، $D\hat{A}E = A\hat{C}D$ (۲) -۵

$D\hat{A}E = A\hat{C}D$
$E = E$
$\Rightarrow ADE \sim AEC$

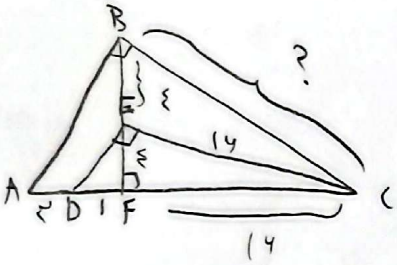
$\frac{AD}{AC} = \frac{AE}{CE} = \frac{ED}{AE}$

$AE^2 = AB^2 + BE^2 \Rightarrow AE^2 = 11^2 + 2^2 \rightarrow AE^2 = 121 + 4 = 100 + 12$

$AE^2 = ED \times CE$

$AE^2 = 10(10 + 2) = 100 + 12$

$x^2 - 12x + 27 = 0 \Rightarrow (x-9)(x-3) = 0 \Rightarrow \begin{cases} x = 9 \\ x = 3 \end{cases}$ ✓



(۲) -۶

$ABC = CED = 90$

$EF^2 = 1 \times FC$

$14 = FC$

$BF^2 = AF \times FC$

$8 \times 14 = 4^2$

$BF = 8$

$BC^2 = BF^2 + FC^2 = 8^2 + 14^2 = 260 \Rightarrow BC = \sqrt{260} = 8\sqrt{2}$ ✓

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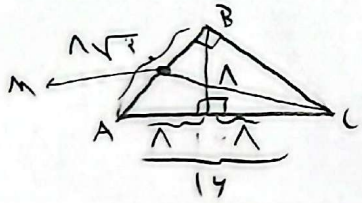
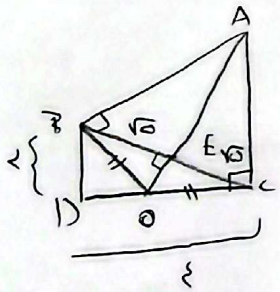
(۲) -۷

$AB^2 = 8^2 + 8^2 = \sqrt{128} = 8\sqrt{2}$



$CM^2 = (4\sqrt{2})^2 + (8\sqrt{2})^2 = 140 \Rightarrow CM = \sqrt{140} = 4\sqrt{10}$ ✓



(۲) -۸

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

$OE = \frac{1}{2}DC \Rightarrow BE = EC = \sqrt{5}$

$EBO \sim BCD \rightarrow \frac{AE}{BE} = \frac{DC}{BD} = 2$

$AE = 2BE = 2\sqrt{5}$ $\quad S_{ABE} = \frac{2\sqrt{5} \times \sqrt{10}}{2} = 5$ ✓

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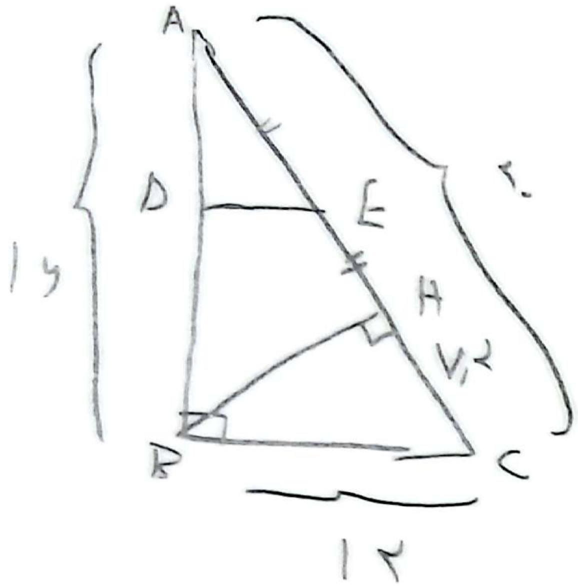
(۲) -۹

$\tan\alpha = \frac{2}{9} = \frac{1}{4} \rightarrow \cos\alpha = \frac{2}{\sqrt{10}}$

$BE = BC \times \frac{BD}{BC} \times \frac{BE}{BD}$

$9 \times \frac{2}{\sqrt{10}} \times \frac{2}{\sqrt{10}} = \frac{18}{10} = 1,8$ ✓

۳ -/۵



$AC^{۲} = ۱۶^{۲} + ۱۲^{۲} = ۴۰۰ \Rightarrow AC = ۲۰$

$۲۵۶ + ۱۴۴$

$\frac{۱۲}{۲۰} = \frac{CH}{۱۲} \Rightarrow CH = \frac{۱۴۴}{۲۰} = ۷,۲$

$AH = ۲۰ - ۷,۲ = ۱۲,۸ \Rightarrow AE = EH = ۶,۴$

$\frac{AE}{AC} = \frac{DE}{BC} \Rightarrow \frac{۶,۴}{۲۰} = \frac{DE}{۱۲} \Rightarrow DE = ۳ \times ۱,۲۸ = ۳,۸۴$

(۱,۲۸ / ۵ / ۱ / ۳ written as cancellations)

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