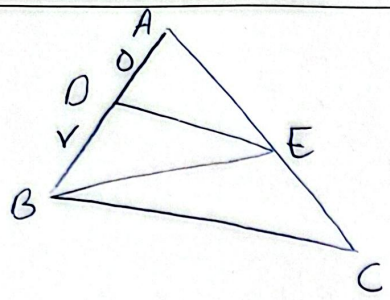
۱۸

نام و نام خانوادگی ..امیرحسین خاشعی.. پاسخنامه تشریحی تکلیف شماره ..۲.. کلاس ..یازدهم ریاضی..

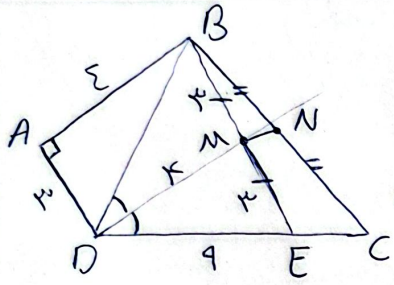
۱



$S_{BDE} = S_{BCE}$ تاس $\rightarrow \frac{AD}{AB} = \frac{DE}{BC} \Rightarrow \frac{DE}{BC} = \frac{5}{12}$

$\frac{S_{BCE}}{S_{BDE}} = \frac{h_{BCE}}{h_{BDE}} \times \frac{BC}{DE} = \frac{12}{5}$ ✓ جواب

۲



$BDM = MDC$

تاس $\rightarrow \frac{BN}{NC} = \frac{BM}{ME} \Rightarrow BM = ME$

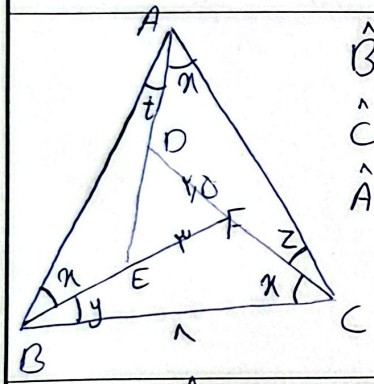
فیثاغورس $\rightarrow ۳^۲ + ۴^۲ = DE^۲ \rightarrow DE = ۵$

$DC - ED = EC \Rightarrow ۹ - ۵ = ۴ = EC$

تاس $\Rightarrow \frac{BN}{BC} = \frac{MN}{EC}$ ($BC = ۴$, $EC = ۴$)

جواب: $MN = ۲$ ✓ جواب

۳



$\hat{B} = \hat{x} + \hat{y} \rightarrow \hat{F} = \hat{x} + \hat{y} \Rightarrow \hat{B} = \hat{F}$

$\hat{C} = \hat{x} + \hat{z} \rightarrow \hat{D} = \hat{x} + \hat{z} \Rightarrow \hat{C} = \hat{D}$

$\hat{A} = \hat{x} + \hat{t} \rightarrow \hat{E} = \hat{x} + \hat{t} \Rightarrow \hat{A} = \hat{E}$

$\xrightarrow{\text{ز ز ز}} ABC \sim DEF$

$\frac{۸}{۱۰} = \frac{AB}{۳} \rightarrow AB = ۹,۶$ ✓ جواب

۴

$MEB \sim DEC \rightarrow \frac{EM}{EC} = \frac{MB}{CD} \Rightarrow \frac{EM}{EC} = \frac{۳}{۶} \rightarrow EM = \frac{۱}{۲} EC \Rightarrow EM = \frac{۱}{۳} CM$

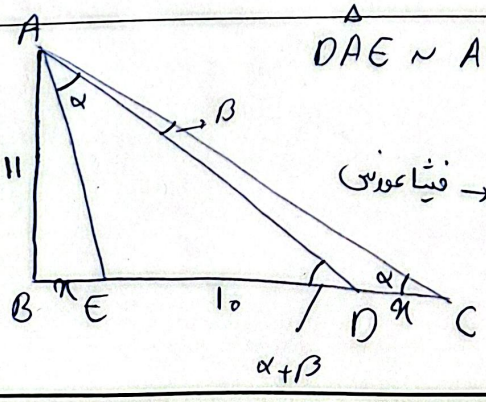
فیثاغورس: $CM^۲ = BC^۲ + BM^۲ \Rightarrow CM^۲ = ۶^۲ + ۳^۲ \rightarrow CM = ۳\sqrt{۵}$

$EM = \frac{۱}{۳} \times ۳\sqrt{۵} = \sqrt{۵}$

$S = \frac{۱}{۲} \times EM \times MF = \frac{۱}{۲} \times \sqrt{۵} \times \frac{۳\sqrt{۵}}{۲} = ۳,۷۵$ ✓ جواب

ز ز ز $\rightarrow FAM \sim CBM \rightarrow \frac{AM}{BC} = \frac{MF}{CM} \Rightarrow \frac{۳}{۶} = \frac{MF}{۳\sqrt{۵}} \rightarrow MF = \frac{۳\sqrt{۵}}{۲}$

۵



$DAE \sim ACE \Rightarrow \frac{AE}{EC} = \frac{ED}{AE} \rightarrow AE^۲ = ۱۰۰ + ۱۰x$

فیثاغورس $\rightarrow AE^۲ = AB^۲ + BE^۲ \rightarrow AE^۲ = ۱۱^۲ + x^۲ = ۱۲۱ + x^۲$

$۱۰۰ + ۱۰x = ۱۲۱ + x^۲ \Rightarrow x^۲ - ۱۰x + ۲۱ = ۰$

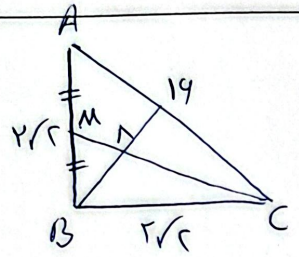
$(x-۳)(x-۷) = ۰$ $\begin{cases} DC = ۳ \\ DC = ۷ \end{cases}$ ✓ جواب

۶ (۲)

$EF^2 = DF \times FC \rightarrow 14 = 1 \times FC \rightarrow FC = 14$

$\triangle ABC$: $BC^2 = CF \times AC \rightarrow BC^2 = 20 \times 14 \rightarrow BC = 8\sqrt{5}$ ✓

۷ (۵)



در مثلث قائم‌الزاویه میانه وارد بر وتر نصف وتر است:

$AB^2 + BC^2 = 14^2 \rightarrow AB = BC = 7\sqrt{2}$

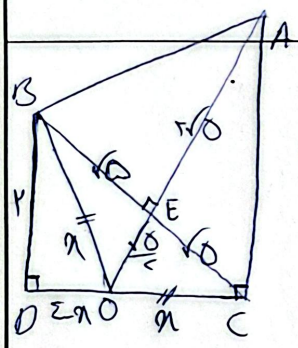
$BM = 2\sqrt{2}$

$BC = 2\sqrt{2}$

فیثاغورثی: $BM^2 + BC^2 = MC^2$

$\rightarrow 8 + 2 = 10 = MC^2 \rightarrow MC = \sqrt{10}$

۸ (۲)



فیثاغورثی $\rightarrow 2^2 + (4-x)^2 = x^2 \rightarrow x = 2{,}5$ ← وضوح

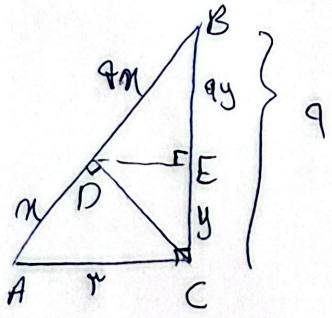
فیثاغورثی $\rightarrow BD^2 + DC^2 = BC^2 \rightarrow BC = 2\sqrt{5} \rightarrow \triangle BOE \cong \triangle OEC$

$BE = EC = \sqrt{5}$ {فیثاغورثی $= x^2 - BE^2 = OE^2 \rightarrow OE = \frac{\sqrt{5}}{2}$

$BE^2 = AE \times OE \rightarrow AE = 2\sqrt{5}$

$S_{ABE}^{\triangle} = \frac{1}{2} \times AE \times BE = 5$ → جواب ✓

۹ (۲)



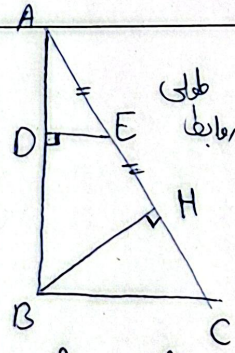
$18 = BD \times AB$

$9 = AD \times AB \rightarrow 9 = \frac{BD}{AD}$

تالس $\rightarrow \frac{9x}{10x} = \frac{DE}{3} \rightarrow DE = 2{,}7$

$10y = 9 \rightarrow y = 0{,}9 \rightarrow BE = 9 \times \frac{9}{10} = 8{,}1$ → جواب ✓

۱۰ (۲)



$AC^2 = 16^2 + 12^2 \rightarrow AC = 20$

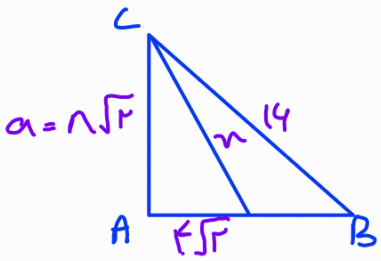
طولی روابط $\rightarrow BH = \frac{AB \times BC}{AC} \rightarrow BH = \frac{16 \times 12}{20} = \frac{48}{5}$

$BC^2 = CH \times AC \Rightarrow 12^2 = CH \times 20 \Rightarrow CH = \frac{144}{20} = \frac{36}{5}$

$AC - CH = AH \rightarrow 20 - \frac{36}{5} = \frac{64}{5} \Rightarrow AE = EH = \frac{32}{5}$

$\triangle AHB \sim \triangle ADE \rightarrow \frac{AE}{AB} = \frac{DE}{BH} \Rightarrow$

$\frac{\frac{32}{5}}{16} = \frac{DE}{\frac{48}{5}} \Rightarrow \frac{2}{5} = \frac{5ED}{48} \rightarrow DE = \frac{96}{25}$ ✓



$$a^۲ + a^۲ = (۱۴)^۲ \rightarrow a = ۸\sqrt{۲}$$

$$x^۲ = (۸\sqrt{۲})^۲ + (۴\sqrt{۲})^۲ \rightarrow x = \boxed{۴\sqrt{۱۰}}$$

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