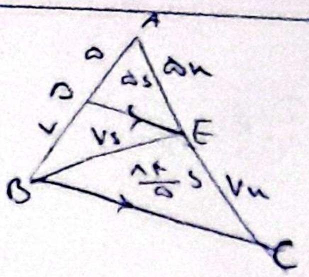
باران کاظمی ۲۰ تکمیلی شماره ۴۲ یازدهم C

۱)



$DE \parallel BC \rightarrow \frac{AD}{DB} = \frac{AE}{EC}$ ۵ ۷

$\frac{۱۲S}{y} = \frac{۵x}{۷x} \rightarrow y = \frac{۸۴}{۵}S$

$\frac{S_{BCE}}{S_{BDE}} = \frac{\frac{۸۴}{۵}\cancel{S}}{۷\cancel{S}} = \frac{۱۲}{۵}$

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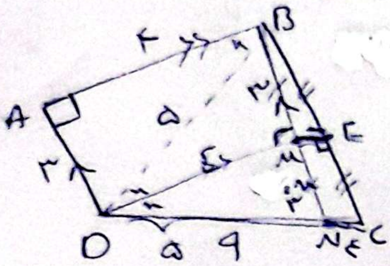
۲)



$\left.\begin{array}{l}\hat{B}_1 = \hat{D}_1 = x \\ \hat{M} = \hat{A} = ۹۰\end{array}\right\} \rightarrow \overset{\triangle}{ABD} \sim \overset{\triangle}{MDN}$

$\frac{AB}{MD} = \frac{AD}{MN} \Rightarrow \frac{\cancel{۴}}{\cancel{۴}} = \frac{۳}{MN} \rightarrow MN = ۳$

$\left.\begin{array}{l}BM = MN \\ BE = EC\end{array}\right\} \rightarrow ME \parallel NC \rightarrow \frac{ME}{NC} = \frac{BM}{BN} \rightarrow \frac{ME}{۴} = \frac{۳}{۶} \rightarrow \boxed{ME = ۲}$

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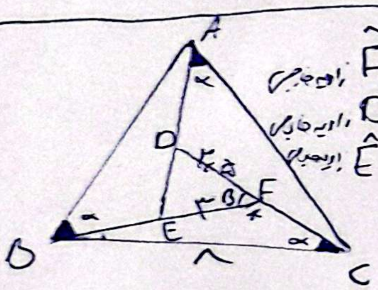
۳)



$\left.\begin{array}{l}\text{زاویه خارجی: } \hat{F} = \alpha + B_1 = B \\ \text{زاویه: } \hat{D} = \hat{C} \\ \text{زاویه خارجی: } \hat{E} = \hat{A}\end{array}\right\} \rightarrow \overset{\triangle}{ABC} \sim \overset{\triangle}{EFD}$

$\frac{AB}{EF} = \frac{BC}{FD} \rightarrow \frac{AB}{۳} = \frac{۸}{۲,۵}$

$\boxed{AB = ۹,۶}$

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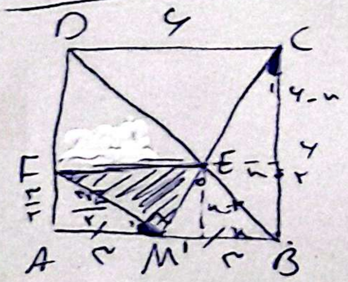
۴)



$\left.\begin{array}{l}\hat{C}_1 = \hat{M}_1 \\ \hat{A} = \hat{B} = ۹۰\end{array}\right\} \rightarrow \overset{\triangle}{CBM} \sim \overset{\triangle}{MAF}$

$\frac{CB}{MA} = \cancel{\frac{CM}{MF}} = \frac{BM}{AF}$

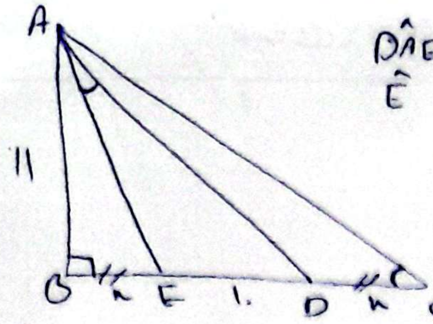
$\frac{۶}{۳} = \frac{۳}{AF} \Rightarrow AF = \frac{۳}{۲}$

$FM = \sqrt{\frac{۹}{۴} + ۹} = \sqrt{\frac{۴۵}{۴}} = \frac{۳}{۲}\sqrt{۵}$

$ME = \sqrt{۴ + ۱} = \sqrt{۵}$

$S_{FEM} = \frac{\sqrt{۵} \times \frac{۳}{۲}\sqrt{۵}}{۲} = \boxed{\frac{۱۵}{۴}}$

۱۵)



$$\left.\begin{array}{l}D\hat{A}E = A\hat{C}D \\ \hat{E} = \hat{E}\end{array}\right\} \to A\hat{E}D \sim \cancel{A\hat{C}E}\ C\hat{E}A$$

$$\frac{AE}{CE} = \frac{ED}{EA} \Rightarrow AE^۲ = ED \times CE \Rightarrow \overset{①}{AE^۲} = ۱۰x + ۱۰۰$$

$$② AE^۲ = x^۲ + ۱۲۱$$

$$\xrightarrow{①②} ۱۰x + ۱۰۰ = x^۲ + ۱۲۱$$

$$\to x^۲ - ۱۰x - ۲۱ = ۰$$
$$(x - ۳)(x - ۷) = ۰ \to \boxed{x = ۳} \ \boxed{x = ۷}$$

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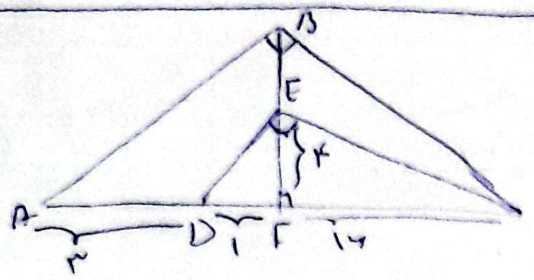
۱۶)



$$EF^۲ = DF \times FC \to ۱۶ = ۱ \times FC \to FC = ۱۶$$

$$BC^۲ = FC \times AC \to BC^۲ = ۱۶ \times ۲۰$$

$$\to BC = ۸\sqrt{۵}$$

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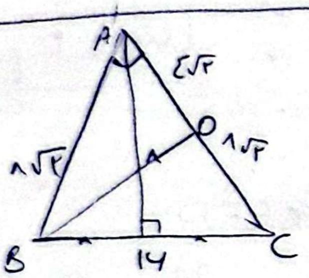
۱۷)



$$BD = \sqrt{۱۲۸ + ۳۲} = \sqrt{۱۶۰} = \boxed{۴\sqrt{۱۰}}$$

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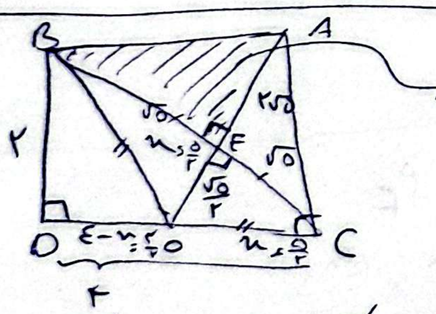
۱۸)



$$S_{A\hat{B}E} = \frac{۲\sqrt{۵} \times \sqrt{۵}}{۲} = \boxed{۵}$$

$$\cancel{x^۲} = ۴ + ۱۶ + \cancel{x^۲} - ۸x$$

$$۸x = ۲۰ \to x = \frac{۵}{۲}$$

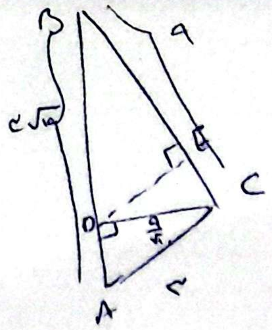
$$BC^۲ = ۱۶ + ۴ = ۲۰ \to BC = ۲\sqrt{۵}$$

$$EO^۲ = \frac{۲۵}{۴} - ۵ = \frac{۵}{۴} \to EO = \frac{\sqrt{۵}}{۲}$$

~~AO~~ $CE^۲ = AE \times EO \to ۵ = AE \times \frac{\sqrt{۵}}{۲}$

$$\boxed{AE = ۲\sqrt{۵}}$$

(۹



$AB = \sqrt{۹+۸۱} = \sqrt{۹۰}$ $\quad$ $۹ = AD \times ۳\sqrt{۱۰} \longrightarrow AD = \frac{۳\sqrt{۱۰}}{۱۰}$

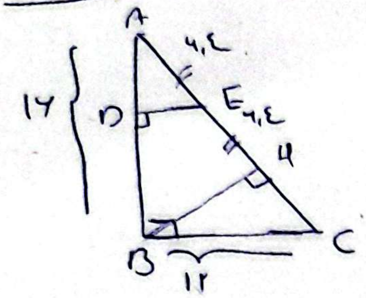
$CD = \sqrt{۹-\frac{۹}{۱۰}} = \sqrt{۸٫۱} = \sqrt{\frac{۸۱}{۱۰}} = \frac{۹}{\sqrt{۱۰}}$

۵

$\frac{۸۱}{۱۰} = EC \times ۹ \rightarrow EC = \frac{۹}{۱۰} \longrightarrow BE = BC - EC = ۹ - \frac{۹}{۱۰} = \boxed{۸٫۱}$

جواب

(۱۰



$AC = \sqrt{۲۵۶+۱۴۴} = \sqrt{۴۰۰} = ۲۰$

$BC^۲ = CH \times AC \longrightarrow ۱۴۴ = CH \times ۲۰ \rightarrow CH = ۷٫۲$

۶

$۲۰ - ۷٫۲ = ۱۲٫۸ \xrightarrow{\div ۲} ۶٫۴ = AE = EH$

$\hat{D} = \hat{B} = ۹۰^\circ \xrightarrow[\text{خطوط موازی}]{\text{عکس قضیه}} ED \parallel BC \rightarrow \frac{DE}{BC} = \frac{AE}{AC}$

$\frac{۶٫۴}{۲۰} = \frac{DE}{۱۲} \rightarrow DE = \boxed{۳٫۸۴}$