

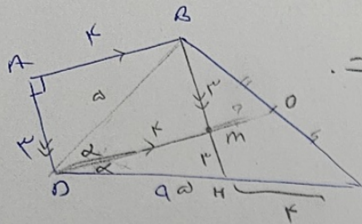
$$\frac{S_{BCE}}{S_{BDE}}$$

$$\frac{AD}{AB} = \frac{DE}{BC} = \frac{\alpha}{12}$$

$$= \frac{h \times \frac{1}{2} \times BC}{h \times \frac{1}{2} \times DE} = \frac{12}{\alpha}$$

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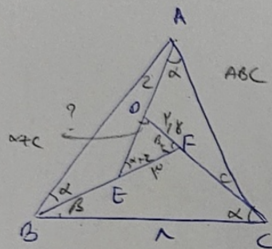


حاصل‌المثل = حاصل‌المثل BDEH
 $\Rightarrow MH = MB = 4$

$$\frac{BM}{MH} = \frac{BO}{OC} \Rightarrow MO \parallel HC \rightarrow \frac{4}{4} = \frac{MO}{2} \Rightarrow MO = 4$$

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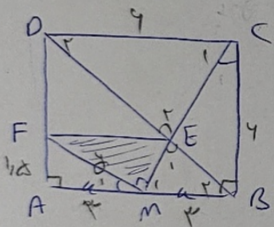
$ABC \sim DEF \Rightarrow \triangle ABC \sim \triangle DEF \Rightarrow$

$$\frac{EF}{AB} = \frac{DE}{AC}$$

$$AB = \frac{EF \times AC}{DE} = 9.4$$

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$\hat{A} = \hat{B} = 90^\circ$
 $\hat{m}_1 = \hat{c}_1 \rightarrow \triangle MAF \sim \triangle CBM$

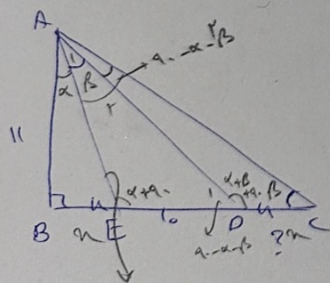
$$\frac{MF}{MA} = \frac{MB}{MC} = \frac{AF}{AC}$$

$$CF^2 + MB^2 = CM^2$$

$$\Rightarrow S_{EMF} = \frac{1}{2} \times \sqrt{2} \times \frac{1}{2} \sqrt{2} = \frac{1}{2}$$

$\hat{E}_1 = \hat{E}_2$
 $BM \parallel DC \rightarrow \hat{C}_1 = \hat{m}_1, \hat{D}_1 = \hat{r}_1 \rightarrow \triangle DEC \sim \triangle MEB \rightarrow \frac{4}{9} = \frac{ME}{EC} = \frac{1}{9} \rightarrow \frac{ME}{EC} = \frac{1}{9}$

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$\hat{A}_1 = \hat{C}$
 $\hat{D}_1 = \hat{A}_2 \rightarrow \triangle AED \sim \triangle CEA$

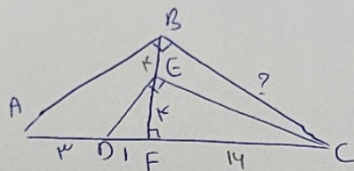
$$\frac{AE}{1+\alpha} = \frac{ED}{AE} = \frac{AD}{AC}$$

$$AE^2 = 1 \times 1 + 1 \times \alpha = 1 + \alpha \rightarrow \alpha^2 - 1 \cdot \alpha + 1 = 0$$

$$\alpha = 1, \sqrt{5}$$

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$$AE = \sqrt{1+1+\alpha}$$



$$EF^2 = DF \times FC$$

$$14 = 1 \times FC$$

$$BF^2 = AF \times FC = 1 \times 14 \rightarrow BF = \sqrt{14}$$

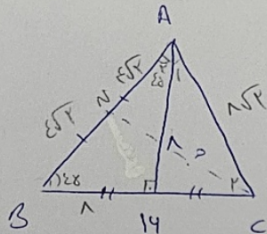
$$BC^2 = BF^2 + FC^2$$

$$\rightarrow 14 + 14^2 = BC^2$$

$$BC = \sqrt{158}$$

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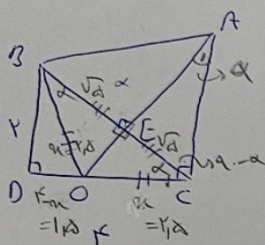
$$AB^2 = AF^2 + BF^2 = 1 + 14 = 15$$

$$\left. \begin{matrix} \hat{A}_1 = \hat{C} \\ \hat{A}_2 = \hat{B} \\ \hat{C} = \hat{B} \end{matrix} \right\} \rightarrow \hat{A}_1 = \hat{A}_2 = \hat{B} = \hat{C} = 90^\circ$$

$$AN^2 + AC^2 = NC^2 \rightarrow (EF)^2 + (BF)^2 = \sqrt{14} = \sqrt{14}$$

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

$$\frac{r}{2} + OE = \frac{r}{2}$$

$$\frac{r}{2} \rightarrow OE = \frac{r}{2}$$

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المثلثات المتشابهة BOC و

$$14 + r^2 - 14 + r^2 = r^2$$

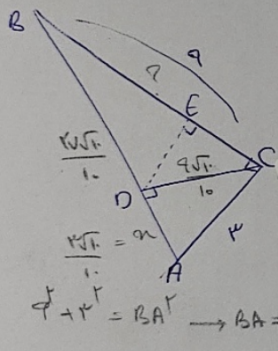
$$\frac{r}{a} = \frac{r}{a}$$

$$\left. \begin{matrix} \hat{A}_1 = \hat{C} \\ \hat{E} = \hat{E} = 90^\circ \end{matrix} \right\} \rightarrow \frac{AE}{EC} = \frac{EC}{EO}$$

$$\frac{AE}{EC} = \frac{EC}{EO} \rightarrow AE = \sqrt{14}$$

$$\rightarrow AE = \sqrt{14}$$

$$S_{ABCE} = \frac{\sqrt{14} \times \sqrt{14}}{2} = 7$$



$$\left. \begin{matrix} \hat{A} = \hat{A} \\ \hat{C} = \hat{D} = 90^\circ \end{matrix} \right\} \rightarrow \triangle ADC \sim \triangle ACB$$

$$\frac{AE}{BA} = \frac{AD}{AC} = \frac{CD}{CB}$$

$$9m^2 + m^2 = 9 \rightarrow m^2 = \frac{9}{10} \rightarrow m = \frac{3\sqrt{10}}{10}$$

$$rAD = CD$$

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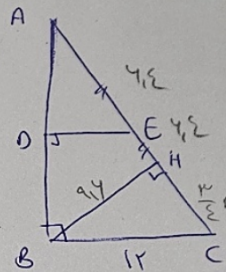
$$r^2 + r^2 = BA^2 \rightarrow BA = \sqrt{14} = \frac{r\sqrt{14}}{10}$$

$$\frac{r}{\sqrt{14}} \times \frac{14}{\sqrt{14}} = 9 \rightarrow DE = \frac{r}{10} \rightarrow \frac{(14)^2}{10} = \frac{(14)^2}{10} + (DE)^2 \rightarrow \frac{9(14)^2}{10} \rightarrow DE = \frac{14\sqrt{14}}{10}$$

$$DE = \frac{14\sqrt{14}}{10} = 1.1$$

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$$\left. \begin{matrix} \hat{C} = \hat{C} \\ \hat{H} = \hat{B} = 90^\circ \end{matrix} \right\} \rightarrow \triangle ABC \sim \triangle BHC$$

$$\frac{AB}{BH} = \frac{BC}{HC} = \frac{AC}{BC}$$

$$BH^2 + \frac{9}{14} BH^2 = 142$$

$$\angle HC = \angle BH \rightarrow HC = \frac{r}{2} BH$$

$$\frac{14}{14} BH^2 = 142 \rightarrow BH = \frac{14 \times 14}{14} = 14 \rightarrow CH = \frac{r}{2} \times 14 = 7$$

$$14^2 = (14)^2 + (CH)^2 \rightarrow rCH = 14 \rightarrow CH = 7$$

$$\frac{DE}{BC} = \frac{7}{14} \rightarrow DE = \frac{7}{2}$$