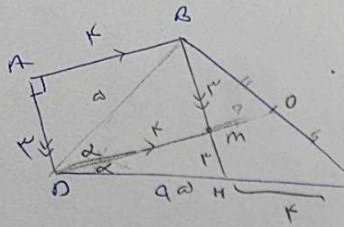


$$\frac{S_{BCE}}{S_{BDE}} = \frac{AD}{AB} = \frac{DE}{BC} = \frac{1}{2}$$

$$\frac{AD}{AB} = \frac{DE}{BC} = \frac{1}{2}$$

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

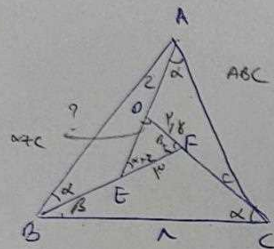
-۱



$$\Rightarrow MH = MB = \frac{1}{2}$$

$$\Rightarrow \frac{BM}{MH} = \frac{BO}{OC} \Rightarrow MO \parallel HC \rightarrow \frac{1}{4} = \frac{MO}{2} \Rightarrow MO = \frac{1}{2}$$

-۲

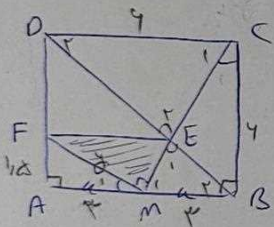


$$ABC \sim DEF \Rightarrow \frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$$

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

$$AB = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$$

-۳



$$\hat{A} = \hat{B} = 90^\circ \Rightarrow \triangle MAF \sim \triangle CBM$$

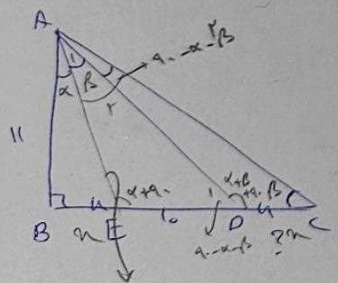
$$\frac{MA}{CB} = \frac{MF}{BM} = \frac{AF}{CM} = \frac{1}{2}$$

$$CE^2 + ME^2 = CM^2 \Rightarrow 1^2 + ME^2 = 2^2 \Rightarrow ME = \sqrt{3}$$

$$\Rightarrow S_{EMF} = \frac{1}{2} \times \sqrt{3} \times \frac{1}{2} = \frac{\sqrt{3}}{4}$$

$$\hat{E}_1 = \hat{E}_2 \Rightarrow \triangle DEC \sim \triangle MEB \rightarrow \frac{1}{4} = \frac{ME}{EC} = \frac{1}{2} \rightarrow \frac{ME}{EC} = \frac{1}{2}$$

-۴

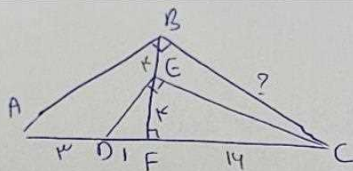


$$\hat{A}_1 = \hat{C} \Rightarrow \triangle AED \sim \triangle CEA$$

$$\frac{AE}{CE} = \frac{ED}{EA} = \frac{AD}{CA}$$

$$AE^2 = 1 \times 1 + 1 \times 1 = 2 \Rightarrow AE = \sqrt{2}$$

$$m = 1, v = 1$$



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

$$14 = 1 \times FC$$

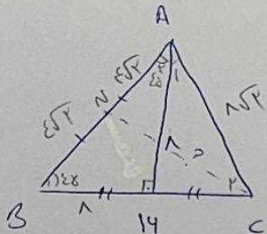
$$BF^2 = AF \times FC = 1 \times 14 \rightarrow BF = \sqrt{14}$$

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

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

$$BC = 14\sqrt{2}$$

-4

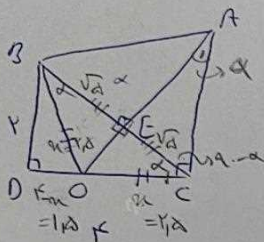


$$AB^2 = AF^2 + BF^2 = 14^2$$

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

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

-5



$$r^2 + r^2 = BC^2 = 14^2 = 196$$

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

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

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في المثلث BOC

المثلث BOC

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

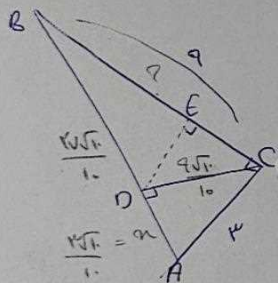
$$\frac{r}{2} = \frac{r}{2}$$

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

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

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

$$S_{ABCE} = \frac{\sqrt{r} \times \sqrt{r}}{2} = \frac{r}{2}$$



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

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

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

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

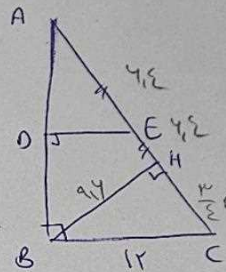
$$rAD = CD$$

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

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

$$OE = \frac{14\sqrt{10}}{10}$$

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

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

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

$$rHC = rBH \rightarrow HC = \frac{r}{2} BH$$

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

$$14^2 = (14)^2 + (7r)^2 \rightarrow r = 14 \rightarrow m = 7r$$

$$\frac{OE}{BC} = \frac{7r}{14} \rightarrow OE = 7r$$