

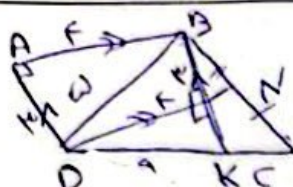
$$DE \parallel BC \rightarrow \triangle ADE \sim \triangle ABC \rightarrow \frac{S_{ADE}}{S_{ABC}} = \left(\frac{AD}{AB}\right)^2 \rightarrow S_{ABC} = \frac{166}{4} S_{ADE}$$

$$\frac{S_{ADE}}{S_{BDE}} = \frac{\frac{1}{2} \cdot EH \cdot \omega}{\frac{1}{2} \cdot EH \cdot \nu} = \frac{\omega}{\nu} \rightarrow S_{BDE} = \frac{\nu}{\omega} S_{ADE}$$

$$S_{BEC} = S_{ABC} - S_{ADE} - S_{BDE} = \frac{166}{4} S_{ADE} - S_{ADE} - \frac{\nu}{\omega} S_{ADE} = \frac{16}{\omega} S_{ADE}$$

$$\frac{S_{BCE}}{S_{BDE}} = \frac{\frac{16}{\omega} S_{ADE}}{\frac{\nu}{\omega} S_{ADE}} = \frac{16}{\nu}$$

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مثلث ABMD

$$AD = MB = \nu$$

$$AB = DM = \omega$$

$$MN = \frac{1}{2} KC$$

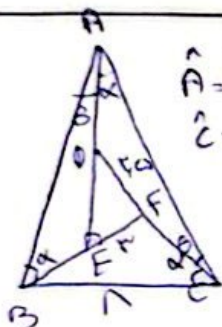
$$\rightarrow MW = \nu$$

مساحت BMN و BKC با نسبت ν و ω متساوی هستند

Dm متساوی است با Dm

$$\hat{D}_1, \hat{D}_2 \text{ از } \frac{\text{مساحت دایره کوچک}}{\text{مساحت دایره بزرگ}} \quad Bm = mk = \nu$$

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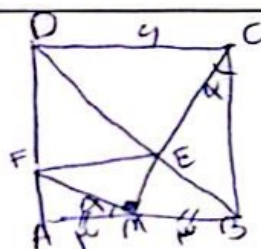
$$\hat{A} = \hat{E} = \alpha, \hat{B} = \beta$$

$$\hat{C} = \hat{D} = \alpha, \hat{A} = \beta$$

$$\textcircled{1}, \textcircled{2} \rightarrow \triangle DEF \sim \triangle ABC$$

$$\frac{EF}{AB} = \frac{DF}{BC} = \frac{DE}{AC} \rightarrow \frac{\nu}{AB} = \frac{\omega}{K} \rightarrow AB = \frac{94}{1}$$

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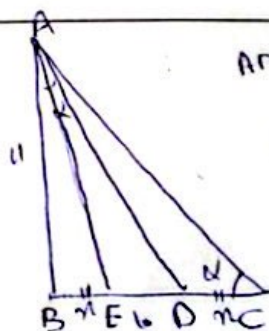
$$\triangle MND \sim \triangle FNC \rightarrow \frac{ME}{CF} = \frac{BM}{DC} = \frac{BE}{ED} = \frac{\nu}{4} = \frac{1}{\nu} \quad \text{A}$$

$$CM = BC + BM = \nu + \omega \quad CM = \sqrt{EA} = \nu\sqrt{2} \quad \rightarrow ME = CE = \nu\sqrt{2}$$

$$\triangle CMN \sim \triangle AMF \rightarrow \frac{BC}{AM} = \frac{MC}{MF} = \frac{BM}{AF} \rightarrow \frac{\nu\sqrt{2}}{MF} = \frac{\nu}{1}$$

$$S_{MEF} = \frac{1}{2} \times \frac{\nu\sqrt{2}}{\nu} \times \nu\sqrt{2} = \frac{100}{K}$$

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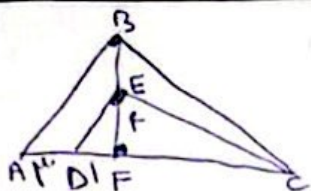


$$AD \cdot BE = AE \cdot \rightarrow (1+\nu) \cdot \nu = \omega \cdot \nu \rightarrow AE = \sqrt{1+\nu}$$

$$\triangle AEC \sim \triangle FED \rightarrow \frac{ED}{AE} = \frac{AE}{EC} = \frac{AD}{AC} \rightarrow AE = ED + EC$$

$$1 + \nu = 1 + (1 + \nu) \rightarrow \nu = \sqrt{1 + \nu}$$

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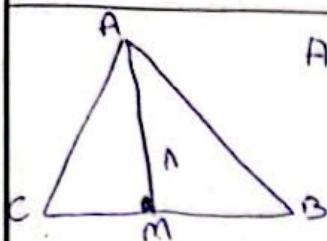


$$EF^2 = DF \cdot FC \rightarrow E^2 = 1 \cdot FC \rightarrow EC = 14$$

$$BF^2 = AF \cdot FC \rightarrow 14 \cdot 4 = AF \cdot 14 \rightarrow BF = 4$$

$$BC^2 = BF^2 + FC^2 \rightarrow BC^2 = 4^2 + 14^2 \rightarrow BC = \sqrt{196} = 14$$

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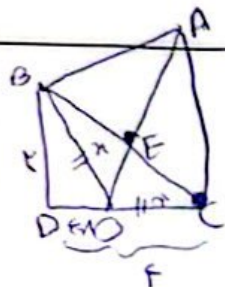
$$AC^2 = 1^2 + 1^2 \rightarrow AC = \sqrt{2}$$

$$C = (1, 0) \quad B = (1, 1) \quad M = (0, 0) \rightarrow A(0, 1)$$

$$D = \left(\frac{0-1}{1}, \frac{1+0}{1} \right) = (-1, 1)$$

$$CD = \sqrt{(0-(-1))^2 + (0-1)^2} = \sqrt{2}$$

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$$BD^2 = OD^2 = BO^2 \rightarrow r^2 + (r \cdot n)^2 = r^2 \rightarrow n = \frac{1}{2}$$

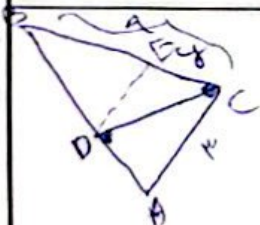
$$BC^2 = BD^2 + DC^2 \rightarrow BC = \sqrt{5} \rightarrow EC = \frac{BC}{2} = \frac{\sqrt{5}}{2}$$

$$OC^2 = EC^2 + EO^2 \rightarrow (r \cdot n)^2 = \left(\frac{\sqrt{5}}{2} \right)^2 + EO^2 \rightarrow EO = \frac{\sqrt{5}}{2}$$

$$EC^2 = AE \cdot EO \rightarrow \left(\frac{\sqrt{5}}{2} \right)^2 = AE \cdot \frac{\sqrt{5}}{2} \rightarrow AE = \frac{\sqrt{5}}{2}$$

$$S_{ABCE} = \frac{1}{2} \times \sqrt{5} \times \frac{\sqrt{5}}{2} = \frac{5}{4}$$

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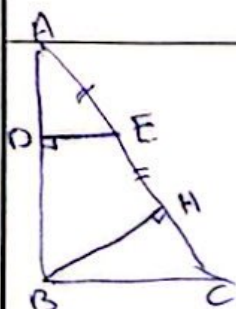


$$AB^2 = AC^2 + BC^2 \rightarrow AB^2 = 9 + 16 \rightarrow AB = 5$$

$$AC^2 = AD \cdot AB \rightarrow AD = \frac{AC^2}{AB} = \frac{9}{5}$$

$$\frac{AB}{AD} = \frac{BC}{EC} \rightarrow \frac{5}{\frac{9}{5}} = \frac{4}{EC} \rightarrow EC = \frac{4}{5} \rightarrow BE = 5 - \frac{4}{5} = \frac{21}{5}$$

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$$AC = \sqrt{(4-1)^2 + (1-0)^2} = \sqrt{10}$$

$$AH \cdot AC = AB \cdot BC \rightarrow AH \cdot \sqrt{10} = 4 \cdot 1 \rightarrow AH = \frac{4}{\sqrt{10}}$$

$$\rightarrow BH = 4 - \frac{4}{\sqrt{10}}$$

$$AH = \sqrt{4^2 - 1^2} = \sqrt{15} \rightarrow AE = \sqrt{15}$$

$$ADE \sim ABH \rightarrow \frac{BH}{DE} = \frac{AB}{AE} \rightarrow DE = \frac{BH \cdot AE}{AB} = \frac{4 \cdot \sqrt{15}}{5}$$

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