

$$OE \parallel BC \Rightarrow \text{نسبت مساوی} = \frac{AO}{AB} = \frac{5}{14} \Rightarrow \text{نسبت مساوی} = \left(\frac{5}{14}\right)^2 = \frac{25}{196} = \frac{S_{ADE}}{S_{ABC}}$$

$$\frac{AO}{AB} = \frac{OE}{BC} \Rightarrow \frac{5}{14} = \frac{OE}{BC} \Rightarrow OE = \frac{5}{14} BC$$

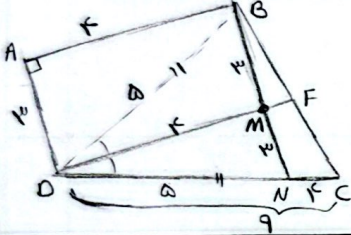
$$\frac{AE}{AC} = \frac{5}{14} \Rightarrow \frac{AE}{AC-AE} = \frac{5}{14-5} \quad \frac{CE}{CA} = \frac{EH}{AB} \Rightarrow \frac{9}{14} = \frac{EH}{14}$$

$$\frac{S_{BCE}}{S_{BDE}} = \frac{\frac{1}{2} \times \frac{14}{14} \times BC}{\frac{1}{2} \times \frac{5}{14} \times BC \times \frac{14}{14}} = \frac{14}{5} = \sqrt{14}$$

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$$BM \parallel AD \Rightarrow AO = BM = 3, AB = OM = 4 \quad AB^2 + AO^2 = OB^2 \Rightarrow 4^2 + 3^2 = 25 \Rightarrow OB = 5$$

$$BOC = 2BOM \Rightarrow \hat{BOM} = \hat{MOC} = \alpha \quad \text{در مثل متساوی الساقین BOM و OM میان خط است} \quad \text{در مثل متساوی الساقین BOM و OM میان خط است}$$



$$\frac{BM}{BN} = \frac{MF}{NC} \Rightarrow \frac{3}{4} = \frac{MF}{4} \Rightarrow MF = 3$$

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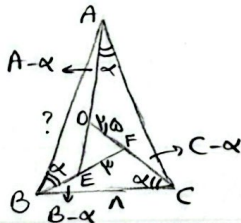
$$\hat{AOC} \text{ زاویه قائمه } \hat{O} = C - \alpha + \alpha = C$$

$$\hat{BFC} \text{ زاویه قائمه } \hat{F} = \alpha + \beta - \alpha = \beta$$

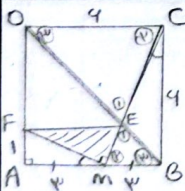
$$\hat{AEB} \text{ زاویه قائمه } \hat{E} = A - \alpha + \alpha = A$$

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

$$\frac{FE}{AB} = \frac{FO}{BC} \Rightarrow \frac{3}{AB} = \frac{5}{14} \Rightarrow AB = \frac{42}{5} = 8.4$$



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$$AM = MB = 2 \quad \hat{BCE} = \hat{AMF}$$

$$\triangle BCM \sim \triangle AMF$$

$$A = B = 90 \Rightarrow F = M$$

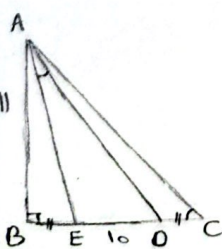
$$\frac{AM}{BC} = \frac{AF}{BM} = \frac{MF}{CM} \Rightarrow AF = \frac{2}{3}, MF = \frac{2\sqrt{5}}{3} = \frac{2\sqrt{5}}{3}$$

$$\hat{E}_1 = \hat{E}_2, \hat{M}_1 = \hat{C}_1, \hat{O}_1 = \hat{B}_1 \Rightarrow \triangle DEC \sim \triangle BEM \Rightarrow \frac{MB}{EC} = \frac{ME}{EC} = \frac{1}{3} \Rightarrow EC = 3ME$$

$$MC = EC + ME = 3ME + ME = 4ME = 2\sqrt{5} \Rightarrow ME = \sqrt{5}$$

$$S_{FME} = \frac{\frac{2\sqrt{5}}{3} \times \sqrt{5}}{2} = \frac{10}{3} = \sqrt{10}$$

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$$\hat{DAE} = \hat{ACD}, BE = DC \quad \underline{BC}$$

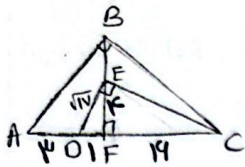
$$\hat{A}_1 = \hat{C}, \hat{E}_1 = \hat{E}_2 \Rightarrow \triangle AED \sim \triangle AEC$$

$$\frac{ED}{AE} = \frac{AE}{CD+10} \Rightarrow AE^2 = 10CD+100 = 141+CD^2 \Rightarrow CD^2 - 10CD+141 = AD^2$$

$$\Delta = 100 - 144 = 14 \quad \frac{10 \pm \sqrt{14}}{2} = \sqrt{14}$$

BC وتر دایره باشد
و ۳ و ۷ در آن است

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$$OF=1 \quad EF=x \quad AD=y \quad BC=?$$

$$OE^2 = 1 + 14 = 15 \Rightarrow OE = \sqrt{15}$$

$$EF^2 = OF \times FC \Rightarrow 1 \times FC = 14 \Rightarrow FC = 14$$

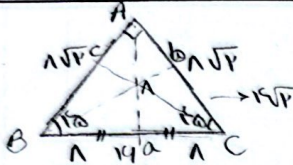
$$AB^2 + BC^2 = \frac{FO^2}{AC^2} = \frac{1}{10} \Rightarrow AB^2 + BC^2 = \frac{1}{10}$$

$$\Rightarrow BC = \sqrt{14/10}$$

$$ABC \sim BAF$$

$$\frac{FA}{BA} = \frac{BF}{BC} = \frac{AB}{AC}$$

$$\Rightarrow AB^2 = 10 \Rightarrow AB = \sqrt{10}$$



$$m_a = \frac{1}{5} \sqrt{1(1\sqrt{5})^2 + 1(14)^2 - (1\sqrt{5})^2} = \frac{1}{5} \sqrt{140} = \frac{1}{5} \times 1\sqrt{10} = \sqrt{10}$$

$$m_b = m_c$$

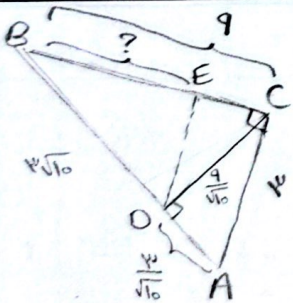
$$BC^2 = 1 + 14 = 15 \Rightarrow BC = \sqrt{15} = \sqrt{10}$$

$$BE = CE = \sqrt{10}$$

$$BOE \sim COE$$

$$\Rightarrow \frac{AC}{BC} = \frac{AE}{CE} = \frac{EC}{BO} \Rightarrow AE = \sqrt{10}$$

$$S_{ABE} = \frac{AE \times BE}{2} = \frac{\sqrt{10} \times \sqrt{10}}{2} = 5$$



$$BA = \sqrt{10}$$

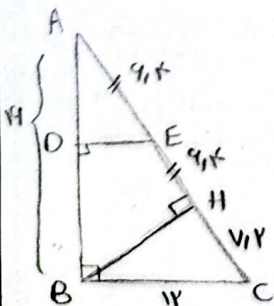
$$AD^2 = 9 - \frac{DC^2}{10} = 0.9$$

$$OC \times AB = \frac{AC \times BC}{2} = OC = \frac{10}{\sqrt{10}} = \frac{9}{\sqrt{10}}$$

$$\Rightarrow AD = \frac{9}{\sqrt{10}}$$

$$\frac{BE}{BC} = \frac{DE}{AC} = \frac{BD}{BA} \Rightarrow AB - AD = \sqrt{10} - \frac{9}{\sqrt{10}} = \frac{10 - 9}{\sqrt{10}} = \frac{1}{\sqrt{10}}$$

$$\frac{BE}{9} = \frac{1}{10} \Rightarrow BE = \frac{9}{10} = 1.1$$



$$\frac{AD}{AB} = \frac{DE}{BC} = \frac{AE}{AC} \Rightarrow DE = \frac{1}{5} AC$$

$$AB \times BC = BH \times AC = 14 \times 14 = 10 \times BH \Rightarrow BH = 19$$

$$(14/4)^2 + x^2 = 14^2 \Rightarrow x^2 = 14^2 - (14/4)^2 = 14^2 - 12.25 = 11.75 \Rightarrow x = \sqrt{11.75}$$

$$AC^2 = 14^2 + 14^2 = 10 \Rightarrow AC = 10$$