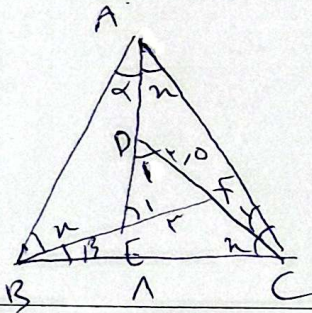


طبق
 قضیه
 تالس
 $BC \parallel DE \Rightarrow \frac{DE}{BC} = \frac{5}{5+V} = \frac{5}{12}$

h ها در سمت با هم برابر

$$\frac{S_{\triangle BEC}}{S_{\triangle DEB}} = \frac{BC}{DE} = \frac{12}{5} = \frac{24}{10} = \boxed{2,4}$$

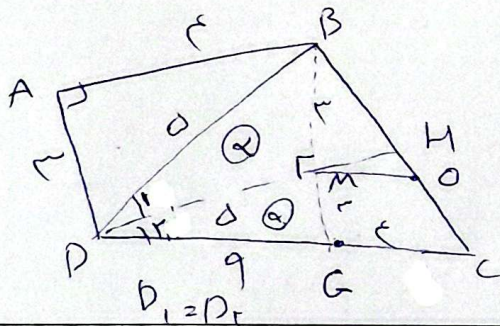


$$\hat{A}BF = \hat{C}AE = \hat{B}CD = \alpha$$

$$\hat{E}_1 \text{ زاویه خارجی } \hat{E}_1 \Rightarrow \hat{E}_1 = \alpha + \alpha = \hat{A}$$

$$\hat{D}_1 \text{ زاویه خارجی } \hat{D}_1 \Rightarrow \hat{D}_1 = \alpha + \alpha = \hat{A}$$

$$\textcircled{I} \Rightarrow \frac{DF}{BC} = \frac{EF}{AB} \Rightarrow \frac{2,5}{12} = \frac{3}{AB} \Rightarrow AB = \frac{3 \times 12}{2,5} = \boxed{14,4}$$



$$\triangle BMO \sim \triangle BGC$$

$$\frac{BM}{BC} = \frac{r}{6} = \frac{1}{2} = \frac{BO}{BC}$$

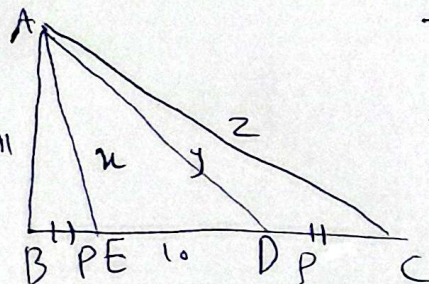
$$\frac{MO}{GC} = \frac{1}{2} \Rightarrow \frac{MO}{6} = \frac{1}{2} \Rightarrow MO = \frac{6}{2} = \boxed{3}$$

$$BM \parallel DC \Rightarrow \triangle BME \sim \triangle DEC$$

$$\frac{ME}{CE} = \frac{BM}{DC} = \frac{2}{6} = \frac{1}{3} \textcircled{I} \quad \hat{B}CM = \hat{C}M = \hat{B}C + \hat{B}M = 4^\circ + 2^\circ = 6^\circ$$

$$CM = 2\sqrt{5} \textcircled{II} \quad \textcircled{I}, \textcircled{II} \Rightarrow ME = \sqrt{5} \quad CE = 2\sqrt{5}$$

$$\triangle AMF \sim \triangle BCM \Rightarrow \frac{AM}{BC} = \frac{MF}{MC} \Rightarrow \frac{2}{6} = \frac{MF}{2\sqrt{5}} \Rightarrow MF = \frac{2}{3}\sqrt{5}$$



$$\frac{n}{10+p} = \frac{y}{n} = \frac{10}{n} \Rightarrow n^2 = 10(10+p)$$

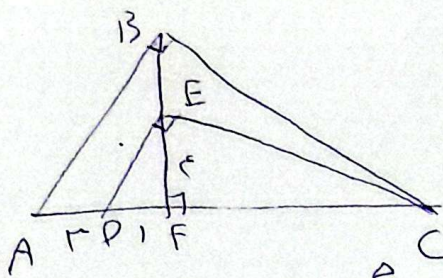
$$\Rightarrow 121 + p^2 = 100 + 10p \Rightarrow p^2 - 10p + 121 = 0$$

$$\Rightarrow (p-5)(p-24) = 0 \quad \begin{cases} p=5 \\ p=24 \end{cases}$$

اندازه PC 24 و 5 می تواند باشد

$$S_{MFE} = \frac{1}{2} ME \times MF = \frac{1}{2} (\sqrt{5} \times \frac{2}{3}\sqrt{5}) = \frac{15}{6} = \boxed{2,5}$$

ادامه سوال
 (5)



$$D \hat{E} C \Rightarrow EF^2 = DF \times FC \Rightarrow EF^2 = 1 \times FC$$

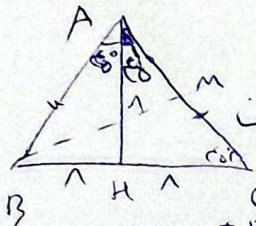
$$FC = 16$$

$$\triangle ABC \Rightarrow BF^2 = AF \times FC \Rightarrow BF^2 = 1 \times 16 \Rightarrow BF = 4$$

$$\triangle C \Rightarrow BF = 4$$

$$\triangle BEC \Rightarrow BC^2 = BF^2 + FC^2 \Rightarrow BC^2 = 4^2 + 16^2 \Rightarrow BC = 16\sqrt{5}$$

* در مثل متساوی الساقین می‌تواند عمود منصف و ارتفاع و خط میانه
به هم افتد و دایره

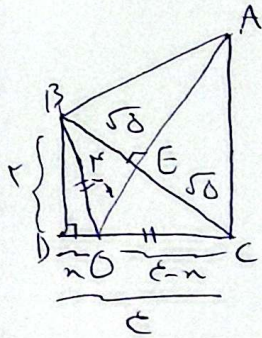


$$AB = AC = \sqrt{AH^2 + HC^2} = \sqrt{6^2 + 6^2} = \sqrt{12} = 12\sqrt{2}$$

$$CM = AM = \frac{AB}{2} = 6\sqrt{2}$$

$$AH = HC \Rightarrow \triangle AHC \Rightarrow \begin{cases} \hat{A} = \hat{C} = 45^\circ \\ \hat{C} = \hat{B} = 45^\circ \end{cases} \Rightarrow \hat{A} = 90^\circ$$

$$BM = \sqrt{AB^2 + AM^2}$$



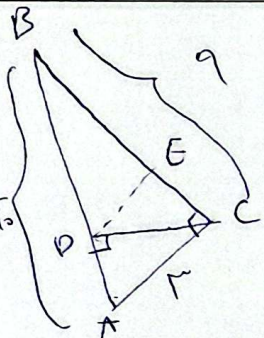
$$(c-n)^2 = n^2 + r^2 \Rightarrow n^2 + r^2 = c^2 - 2cn + n^2 \Rightarrow r^2 = c^2 - 2cn$$

$$12n = 12 \Rightarrow n = \frac{1}{r}$$

$$BM = CM = c - \frac{r}{2} = \frac{D}{r} \quad BC = \sqrt{c^2 + r^2} = 2\sqrt{5}$$

$$BM = \sqrt{\left(\frac{D}{r}\right)^2 - (\sqrt{5})^2} = \sqrt{\frac{D^2}{r^2} - 5} = \frac{\sqrt{D^2 - 5r^2}}{r}$$

$$EC^2 = EM \times AE \Rightarrow 5 = \frac{\sqrt{5}}{r} \times AE \Rightarrow AE = 2\sqrt{5}$$



$$BC^2 = BD \times AB \Rightarrow 2\sqrt{5} = BD \times \sqrt{10}$$

$$\Rightarrow BD = \frac{2\sqrt{5}}{\sqrt{10}}$$

$$BD^2 = BE \times BC$$

$$\Rightarrow \frac{2\sqrt{5}}{10} = BE \times 9 \quad BE = \frac{2\sqrt{5} \times \sqrt{10}}{10 \times 9} = \frac{2}{9}$$

$$AB^2 = AH \times AC \quad 16^2 = AH \times 20$$

در مثل متساوی الساقین

$$AH = \frac{16^2}{20} = \frac{256}{20} = 12.8$$

$$AE = EH = \frac{AH}{2} = 6.4$$

$$\triangle ADE \sim \triangle ABC \quad \left. \begin{array}{l} \text{مردود} \\ \hat{A} = \hat{A} \end{array} \right\} \Rightarrow \frac{AB}{AC} = \frac{DE}{BC} \quad \frac{6.4}{20} = \frac{DE}{12} \Rightarrow DE = 12 \times \frac{6.4}{20} = 3.84$$