

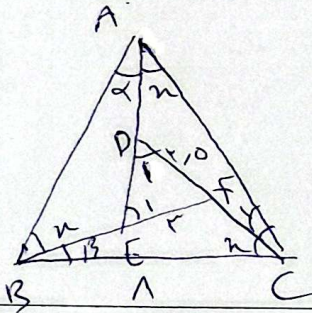
طبق
تقین
الس
ها در مثل با هم برابر

$$BC \parallel DE \Rightarrow \frac{DE}{BC} = \frac{5}{5+12} = \frac{5}{17}$$

$$\frac{S_{\triangle BEC}}{S_{\triangle DEB}} = \frac{BC}{DE} = \frac{17}{5} = \frac{34}{10} = 3,4$$

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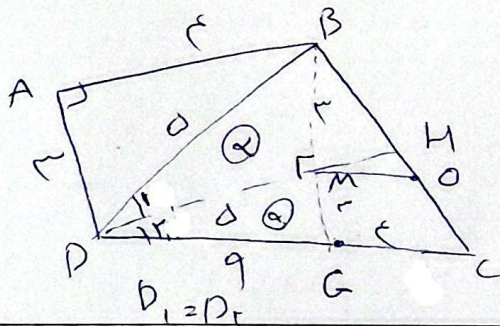
$$\angle BAF = \angle CAE = \angle CBD = n$$

زاویه خارجی $\hat{E}_1 \Rightarrow \hat{E}_1 = n + \alpha = \hat{A}$
در $\triangle ABE$
زاویه خارجی $\hat{D}_1 \Rightarrow \hat{D}_1 = n + \gamma = \hat{C}$
در $\triangle ADC$

$$\textcircled{I} \Rightarrow \frac{DF}{BC} = \frac{EF}{AB} \Rightarrow \frac{r}{17} = \frac{s}{17} \Rightarrow \frac{r}{s} = \frac{3}{5} \Rightarrow AB = \frac{3 \times 17}{5} = 11,4$$

سوال ۳
جواب

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



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

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

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

سوال ۲
جواب

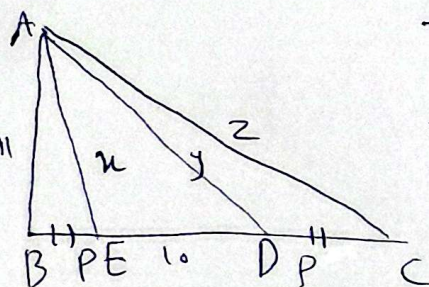
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$$BM \parallel DC \Rightarrow \triangle BME \sim \triangle DEC$$

$$\frac{ME}{CE} = \frac{BM}{DC} = \frac{r}{6} = \frac{1}{2} \textcircled{I} \quad \angle BCM = \angle CME = \angle BCE + \angle BME = \gamma + r = 90^\circ$$

$$CM = 3\sqrt{5} \textcircled{II} \quad \textcircled{I}, \textcircled{II} \Rightarrow ME = \sqrt{5} \quad CE = 2\sqrt{5}$$

از $\triangle AMF \sim \triangle BCM$ برای زاویه α و γ برای زاویه β داریم: $\frac{AM}{BC} = \frac{MF}{MC} \Rightarrow \frac{r}{6} = \frac{MF}{3\sqrt{5}} \Rightarrow MF = \frac{r}{2}\sqrt{5}$



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

$$\Rightarrow 121 + p^2 = 100 + 10p \Rightarrow p^2 - 10p + 21 = 0$$

$$\Rightarrow (p-7)(p-3) = 0 \Rightarrow p=3 \text{ or } p=7$$

اندازه PC ۷ و ۳ می تواند باشد

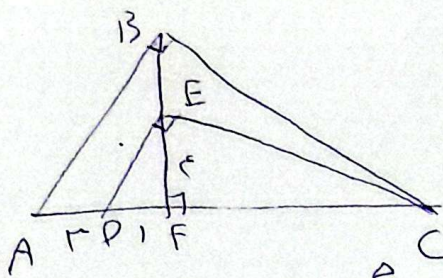
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ادامه سوال
(۵)

(ادامه در پایین صفحه)

$$S_{\triangle MFE} = \frac{1}{2} ME \times MF = \frac{1}{2} (\sqrt{5} \times \frac{3}{2}\sqrt{5}) = \frac{15}{4} = 3,75$$



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

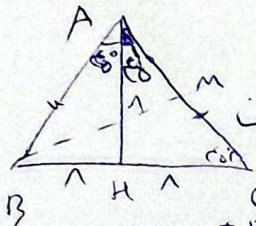
$$FC = 16$$

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

$$\triangle C \Rightarrow BF = 16$$

$$\triangle BFC \Rightarrow BC^2 = BF^2 + FC^2 \Rightarrow BC^2 = 16^2 + 16^2 \Rightarrow BC = 16\sqrt{2}$$

* در مثل متساوی الساقین میانه عمود منصف و ارتفاع و خط وسط
برهم انطباق دارند

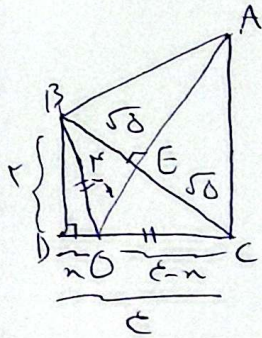


$$AB = AC = \sqrt{AH^2 + HC^2} = \sqrt{6^2 + 6^2} = \sqrt{72} = 6\sqrt{2}$$

$$CM = AM = \frac{AB}{2} = 3\sqrt{2}$$

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

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



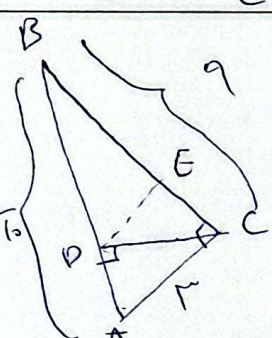
$$(c-n)^2 = n^2 + r^2 \Rightarrow n^2 + r^2 = c^2 - 2cn + n^2 \Rightarrow r^2 = c^2 - 2cn$$

$$16n = 12 \Rightarrow n = \frac{3}{4}$$

$$BM = CM = c - \frac{r}{2} = \frac{1}{2} \quad BC = \sqrt{6^2 + 3^2} = 3\sqrt{5}$$

$$BM = \sqrt{\left(\frac{5}{4}\right)^2 + \left(\sqrt{5}\right)^2} = \sqrt{\frac{25}{16} + 5} = \sqrt{\frac{85}{16}} = \frac{\sqrt{85}}{4}$$

$$EC^2 = EM \times AE \Rightarrow 0 = \frac{\sqrt{5}}{4} \times AE \Rightarrow AE = 2\sqrt{5}$$



$$BC^2 = BD \times AB \Rightarrow 16 = BD \times 10 \Rightarrow BD = \frac{8}{5}$$

$$\Rightarrow BD = \frac{8}{5}$$

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

$$\Rightarrow \frac{64}{25} = BE \times 9 \Rightarrow BE = \frac{64}{25 \times 9} = \frac{64}{225} = \frac{16}{56.25} = \frac{16}{56.25}$$

$$AB^2 = AH \times AC$$

$$16^2 = AH \times 20$$

در مثل متساوی الساقین

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

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

$$\triangle ADE \sim \triangle ABC \quad \left. \begin{array}{l} \text{مردود} \\ \hat{A} = \hat{A} \end{array} \right\} \Rightarrow \frac{AB}{AC} = \frac{DE}{BC} \quad \frac{6.4}{20} = \frac{DE}{16} \Rightarrow DE = 12.8 \times \frac{6.4}{20} = 4.096$$