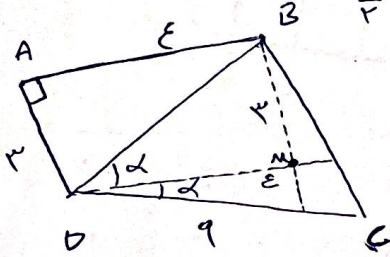


$DE \parallel BC \Rightarrow \triangle ABC \sim \triangle ADE \Rightarrow \frac{AD}{AB} = \frac{AE}{AC} = \frac{DE}{BC}$

چون $\triangle BDE$ و $\triangle BCE$ ارتفاع یکسان از

رأس B دارند $\Rightarrow \frac{S_{BDE}}{S_{BCE}} = \frac{DE}{BC} = \frac{12}{14} \Rightarrow \frac{S_{BCE}}{S_{BDE}} = \frac{14}{12} \star$

$\frac{1}{4} \hat{BDC} = \hat{BDM} \Rightarrow DM \text{ نصف زاویه } \hat{BDC} \Rightarrow \frac{BM}{MC} = \frac{BD}{DC} \Rightarrow$
 $(BD=7, DC=9) \Rightarrow \frac{7}{9} = \frac{BM}{MC} \Rightarrow MC = \frac{27}{4}$
 $BC \text{ وتر } \rightarrow \frac{BC}{2} = \frac{7}{4} \Rightarrow BC = \frac{7}{2} \rightarrow \text{مساحت } \triangle BDC = \frac{1}{2} \times \frac{7}{2} \times 9 = \frac{63}{4} \star$



$\frac{AB}{BC} = \frac{DE}{EF} \rightarrow \frac{AB}{14} = \frac{7}{9} \Rightarrow AB = \frac{49}{3} \star$

برای زاویه برابر

$AM=MB=7, \triangle BCE \sim \triangle AMF \Rightarrow FM=7, FE=7$
 (قطوع زاویه 90° ساخته) (زاویه)

$S_{\triangle AMF} = \frac{1}{2} \times FM \times FE = \frac{1}{2} \times 7 \times 7 = \frac{49}{2} \rightarrow \frac{49}{2} = 24.5 \star$

$\triangle ACD \sim \triangle ADE \Rightarrow \frac{AD}{AE} = \frac{AC}{AD} \Rightarrow AD^2 = AE \cdot AC \rightarrow$
 $BE=DC, BC=BE+ED+DC=2DC+10 \rightarrow 0 < DC < 10$

دوره مثبت کمتر از ۱۰

$$\begin{aligned} \triangle ABC \sim \triangle CED \quad (ii) \quad , AB \perp BC \quad EF \perp DC \Rightarrow \frac{BC}{CE} = \frac{AB}{ED} \Rightarrow \begin{cases} ED = EF + DF = \varepsilon + 1 = \omega \\ AB = AD + DF = \varepsilon + 1 = \omega \end{cases} \\ \frac{BC}{CE} = \frac{\varepsilon}{\omega} \quad , CE = \sqrt{ED^2 + DC^2} \rightarrow DC = \sqrt{\varepsilon 1} \end{aligned}$$

$$BC = \frac{\varepsilon}{\omega} \times \sqrt{\varepsilon 1} \rightarrow \frac{\varepsilon \sqrt{\varepsilon 1}}{\omega} \quad *$$

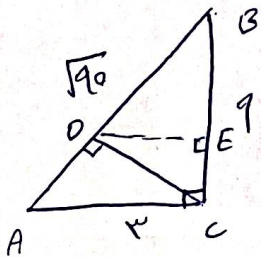
$$AD = \frac{1}{\sqrt{2}} BC = 1 \rightarrow AD \perp BC \Rightarrow AB = \sqrt{2} \quad \text{من } AB \text{ و } E \text{ و } C \Rightarrow CE^2 = BC^2 + BE^2 - 2BC \cdot BE \cdot \cos B \Rightarrow$$

$$CE^2 = 14^2 + (\varepsilon \sqrt{2})^2 - 2 \times 14 \times \varepsilon \sqrt{2} \Rightarrow CE = \boxed{\varepsilon \sqrt{10}} \quad * \text{ جواب } *$$

$$\begin{aligned} 1) OE^2 = BE \times CE \quad \frac{E = \hat{E} = 90^\circ, OB = OC}{OE = OE} \rightarrow BE = CE \Rightarrow OE = BE = CE, BC = 2\sqrt{2} \\ \Rightarrow OE = BE = CE = \sqrt{2} \quad , BO = OC \rightarrow O \text{ وسط } DC, BE \perp AD \Rightarrow \end{aligned}$$

$$AB \text{ و } C \text{ و } D = \sqrt{\varepsilon^2 + (4 - \varepsilon)^2} = \sqrt{16 + 4\varepsilon - \varepsilon^2} \Rightarrow 5 = \frac{1}{\sqrt{2}} \sqrt{16 + 4\varepsilon - \varepsilon^2} \times \frac{\varepsilon}{\sqrt{2\varepsilon}} \Rightarrow \boxed{5 = \sqrt{2}} \quad *$$

$$\triangle AOC \sim \triangle ABC \Rightarrow \frac{AC}{AB} = \frac{AO}{AC} \rightarrow \frac{3}{\sqrt{90}} = \frac{AO}{3} \Rightarrow \frac{9}{\sqrt{90}} = AO \rightarrow \boxed{AO = \frac{3\sqrt{10}}{10}}$$



$$\text{من } DE \parallel AC \rightarrow \frac{BE}{9} = \frac{\frac{3\sqrt{10}}{10}}{3\sqrt{10}} \Rightarrow \boxed{1,1 = BE} \quad * \text{ جواب } *$$

$$\begin{aligned} \hat{A} = \hat{B} = 90^\circ \quad \hat{C} = \hat{C} \quad \left\{ \begin{aligned} \triangle ABC \sim \triangle HCA \Rightarrow \frac{BC}{AC} = \frac{HC}{BC} \Rightarrow \frac{12}{20} = \frac{20 - AH}{12} \Rightarrow AH = 12,1 \end{aligned} \right. \end{aligned}$$

$$AH = AE + EH \xrightarrow{AE = EH} AE = EH = 9,1 \quad \text{من } \frac{DE}{BC} = \frac{AE}{AC} \rightarrow \frac{DE}{12} = \frac{9,1}{20} \Rightarrow DE = 9,1 \times \frac{12}{20} = 5,46$$

$$\boxed{DE = 5,46} \quad * \text{ جواب } *$$