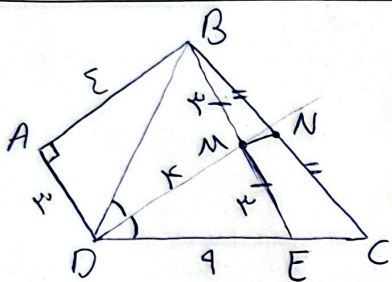


$$h_{BDE} = h_{BCE} \quad \text{تاسی} \rightarrow \frac{AD}{AB} = \frac{DE}{BC} \Rightarrow \frac{DE}{BC} = \frac{8}{12}$$

$$\frac{S_{BCE}}{S_{BDE}} = \frac{h_{BCE}}{h_{BDE}} \times \frac{BC}{DE} = \left(\frac{12}{8} \right) \rightarrow \text{جواب}$$



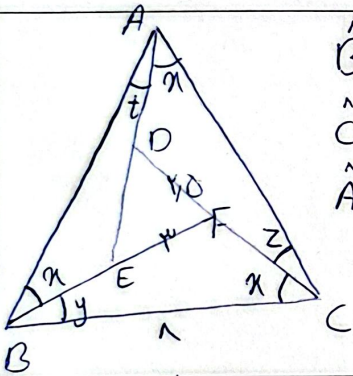
$$BDM = MDC$$

$$\text{تاسی} \rightarrow \frac{BN}{NC} = \frac{BM}{ME} \Rightarrow BM = ME$$

$$\text{فیتاغوری} \rightarrow 8^2 + 4^2 = DE^2 \rightarrow DE = 8$$

$$DC - ED = EC \Rightarrow 12 - 8 = EC \Rightarrow EC = 4$$

$$\text{تاسی} \Rightarrow \frac{BN}{BC} = \frac{MN}{EC} \Rightarrow \frac{6}{12} = \frac{MN}{4} \Rightarrow MN = 2$$



$$\left. \begin{aligned} \hat{B} &= \hat{\alpha} + \hat{\gamma} \rightarrow \hat{F} = \hat{\alpha} + \hat{\gamma} \Rightarrow \hat{B} = \hat{F} \\ \hat{C} &= \hat{\alpha} + \hat{z} \rightarrow \hat{D} = \hat{\alpha} + \hat{z} \Rightarrow \hat{C} = \hat{D} \\ \hat{A} &= \hat{\alpha} + \hat{t} \rightarrow \hat{E} = \hat{\alpha} + \hat{t} \Rightarrow \hat{A} = \hat{E} \end{aligned} \right\} \xrightarrow{iii} \triangle ABC \sim \triangle DEF$$

$$\frac{1}{10} = \frac{AB}{12} \rightarrow AB = 9.4 \rightarrow \text{جواب}$$

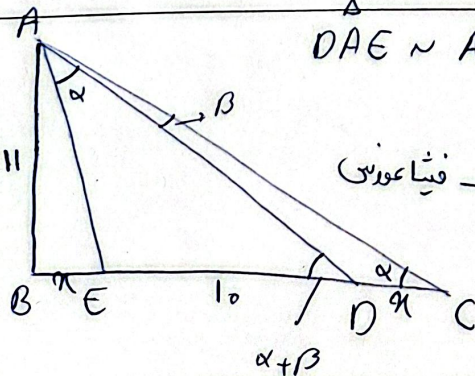
$$\triangle MEB \sim \triangle DEC \rightarrow \frac{EM}{EC} = \frac{MB}{CD} \Rightarrow \frac{EM}{EC} = \frac{4}{12} \rightarrow EM = \frac{1}{3} EC \Rightarrow EM = \frac{1}{3} CM$$

$$\text{فیتاغوری: } CM^2 = BC^2 + BM^2 \Rightarrow CM^2 = 12^2 + 4^2 \Rightarrow CM = 4\sqrt{5}$$

$$EM = \frac{1}{3} \times 4\sqrt{5} = \frac{4\sqrt{5}}{3}$$

$$S = \frac{1}{2} \times EM \times MF = \frac{1}{2} \times \frac{4\sqrt{5}}{3} \times \frac{4\sqrt{5}}{3} = \frac{16}{3}$$

$$iii \rightarrow \triangle FAM \sim \triangle CBM \rightarrow \frac{AM}{BC} = \frac{MF}{CM} \Rightarrow \frac{3}{12} = \frac{MF}{4\sqrt{5}} \rightarrow MF = \frac{4\sqrt{5}}{3}$$



$$\triangle DAE \sim \triangle ACE \Rightarrow \frac{AE}{EC} = \frac{ED}{AE} \rightarrow AE^2 = 100 + 10x$$

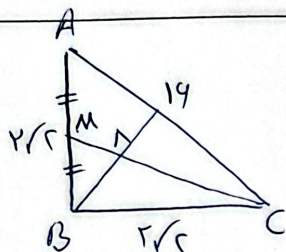
$$\text{فیتاغوری} \rightarrow AE^2 = AB^2 + BE^2 \rightarrow AE^2 = 11^2 + x^2 = 121 + x^2$$

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

$$(x-3)(x-7) = 0 \Rightarrow \begin{cases} DC = 3 \\ DC = 7 \end{cases} \rightarrow \text{جواب}$$

$$EF^2 = DF \times FC \rightarrow 14 = 1 \times FC \rightarrow FC = 14$$

$$\triangle ABC: BC^2 = CF \times AC \rightarrow BC^2 = 10 \times 14 \rightarrow BC = 14\sqrt{10}$$



در مثلث قائم الزاویه با وتر ۱۴ و ارتفاع ۱۰ است :

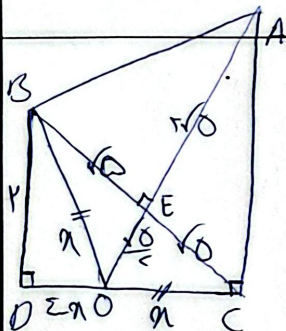
$$AB^2 + BC^2 = 14^2 \rightarrow AB = BC = 10\sqrt{2}$$

$$BM = 10$$

$$BC = 10\sqrt{2}$$

$$\text{فرض کنیم: } BM^2 + BC^2 = MC^2$$

$$\rightarrow 10 + 14 = 24 = MC^2 \rightarrow MC = \sqrt{24}$$



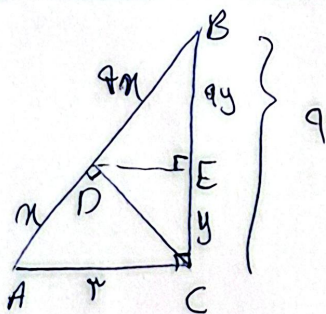
$$\text{فرض کنیم: } 10^2 + (14 - x)^2 = x^2 \rightarrow x = 10$$

$$\text{فرض کنیم: } BD^2 + DC^2 = BC^2 \rightarrow BC = 10\sqrt{2} \rightarrow \triangle BOE \cong \triangle OEC$$

$$BE = EC = \sqrt{2} \quad \left\{ \begin{array}{l} \text{فرض کنیم: } x^2 - BE^2 = OE^2 \end{array} \right. \rightarrow OE = \frac{\sqrt{2}}{2}$$

$$BE^2 = AE \times OE \rightarrow AE = 2\sqrt{2}$$

$$S_{ABE} = \frac{1}{2} \times AE \times BE = \text{جواب}$$

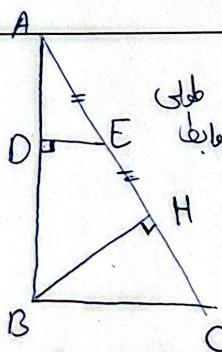


$$M = BD \times AB$$

$$9 = AD \times AB \rightarrow 9 = \frac{BD}{AD}$$

$$\text{فرض کنیم: } \frac{9}{10} = \frac{DE}{10} \rightarrow DE = 9$$

$$10y = 9 \rightarrow y = 0.9 \rightarrow BE = 9 \times \frac{1}{10} = 0.9 \rightarrow \text{جواب}$$



$$AC^2 = 14^2 + 10^2 \rightarrow AC = 20$$

$$\text{فرض کنیم: } BH = \frac{AB \times BC}{AC} \rightarrow BH = \frac{14 \times 10}{20} = 7$$

$$BC^2 = CH \times AC \Rightarrow 10^2 = CH \times 20 \Rightarrow CH = \frac{100}{20} = 5$$

$$AC - CH = AH \rightarrow 20 - 5 = 15 = \frac{40}{2} \Rightarrow AE = EH = \frac{10}{2}$$

$$\triangle AHB \sim \triangle ADE \rightarrow \frac{AE}{AB} = \frac{DE}{BH} \Rightarrow$$

$$\frac{10}{20} = \frac{DE}{7} \Rightarrow \frac{1}{2} = \frac{DE}{7} \rightarrow DE = \frac{7}{2}$$