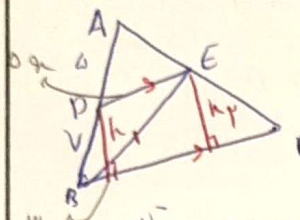


چون $DE \parallel BC \Rightarrow h_1, h_2 \perp DE, BC$ و $h_1 = h_2 \rightarrow$ فواصل از موازی اند

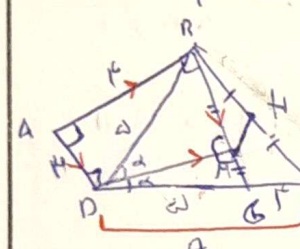


$S_{BCE} = \frac{1}{2} \times BC \times h_2$ $S_{BDE} = \frac{1}{2} \times DE \times h_1$

$DE \parallel BC \Rightarrow \frac{AD}{AB} = \frac{DE}{BC} \Rightarrow \frac{5}{12} = \frac{DE}{BC} \rightarrow DE = \frac{5}{12} \times BC = 12.5$

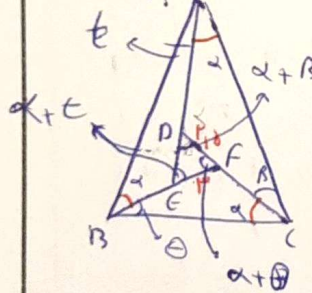
$\frac{S_{BCE}}{S_{BDE}} = \frac{\frac{1}{2} \times BC \times h_2}{\frac{1}{2} \times DE \times h_1} = \frac{BC}{DE} = \frac{12}{5} = 2.4$

چون AD عمود بر AB است بر حسب



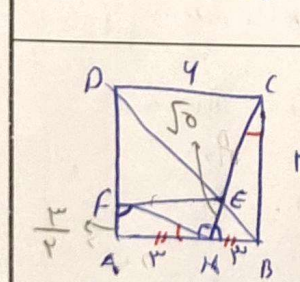
$DH \perp AB$ و $AD \perp BC$
 $\angle D_1 = \angle D_2$ و $\angle H_1 = \angle H_2 = 90^\circ$
 $\therefore \triangle DHG \cong \triangle HBR \rightarrow DB = DG$

چون $\frac{BH}{HC} = \frac{AH}{HG}$ به این $GC \parallel BH$
 $\frac{BH}{GC} = \frac{AH}{HG} \rightarrow \frac{BH}{GC} = \frac{1}{2} \rightarrow BH = 2$



$\alpha + \beta = D$
 $\alpha + \theta = F$
 $\alpha + \epsilon = E$

$\triangle DEF \sim \triangle ABC \rightarrow (ii) \rightarrow \frac{AB}{EF} = \frac{BC}{DF} \rightarrow \frac{AB}{2} = \frac{1}{2.5} \rightarrow AB = 9.4$

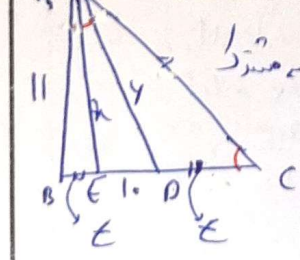


$\triangle DCE \sim \triangle MBE \rightarrow (ii) \rightarrow \frac{DE}{BE} = \frac{CE}{ME} \rightarrow CE = ME$

$\triangle MCB \Rightarrow MB + BC = MC \rightarrow 4 + 4 = 8$
 $MC \cdot \sqrt{2} = 8\sqrt{2} \rightarrow ME + CE = 8\sqrt{2} \rightarrow ME = 4\sqrt{2} \rightarrow ME = \sqrt{2}$

$\triangle AFH \sim \triangle MBE \rightarrow (ii) \rightarrow \frac{AF}{ME} = \frac{AE}{BE} \rightarrow \frac{AF}{\sqrt{2}} = \frac{4}{4} \rightarrow AF = \sqrt{2}$

$MF = AM + AF \rightarrow MF = 4 + \sqrt{2} \rightarrow \frac{MF}{F} = \frac{4 + \sqrt{2}}{\sqrt{2}} \rightarrow HF = \frac{4 + \sqrt{2}}{\sqrt{2}}$

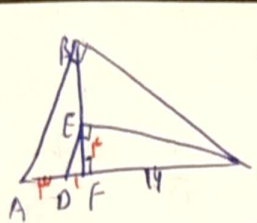


$\triangle AED \sim \triangle AEC \rightarrow \frac{AD}{AC} = \frac{AE}{AC} \rightarrow \frac{1}{1+t} = \frac{1}{1} \rightarrow t = 0$

$t = 1 + (1+t) \rightarrow AB = 1 + t = 2$

$t + 1 + 1 = 1 + 1 + t \rightarrow t = 1$

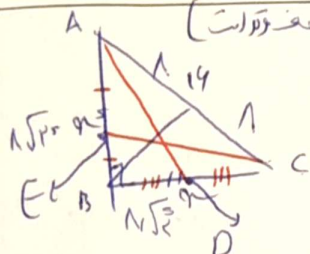
$DC \parallel V$



$$\Delta DEC \rightarrow EF \perp FC \rightarrow 14 \propto FC \rightarrow FC = 14$$

$$\Delta ABC \rightarrow BF \perp AC \rightarrow BF \perp FC \rightarrow BF \propto 14 \rightarrow BF = 14$$

$$\Delta BFC \rightarrow BF \perp FC \rightarrow BC \perp FC \rightarrow 14^2 + 14^2 = 49 + 49 = 98 \rightarrow BC = \sqrt{98} = 7\sqrt{2}$$



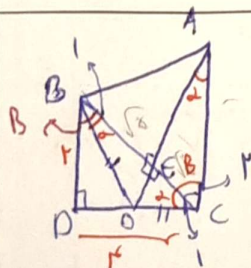
در این مسئله داریم که نقطه E بر خط AD است و خط BE عمود بر AC است. (فرض داریم که نقطه E بر خط AD است)

$$14^2 = 49 \rightarrow 49 = 14^2$$

$$AD^2 = BD^2 + AB^2 \rightarrow AD^2 = \left(\frac{14}{2}\right)^2 + (14)^2$$

$$AD = 14\sqrt{2}$$

$$CE^2 = BE^2 + BC^2 \rightarrow CE^2 = \left(\frac{14}{2}\right)^2 + (14)^2 = 14^2 \rightarrow CE = 14$$

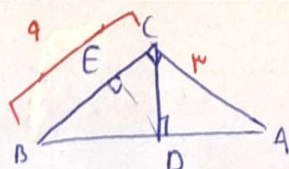


$$\Delta BDC \rightarrow 14 + 14 = BC \rightarrow BC = 28 \quad \Delta EDC \cong \Delta EDB \rightarrow EC = BE \Rightarrow$$

$$EC = BE = \frac{28}{2} = 14$$

$$\Delta EDC \cong \Delta EDB \rightarrow (ii) \rightarrow \frac{EC}{BD} = \frac{AE}{DC} = \frac{AC}{BC}$$

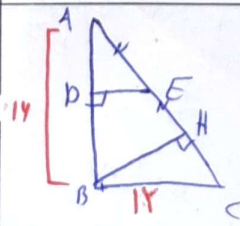
$$\frac{14}{14} = \frac{AE}{14} \rightarrow AE = 14 \quad \Delta ABE \rightarrow \frac{1}{2} \times 28 \times 14 = 196$$



$$BC \perp AD \rightarrow AB \perp AD \rightarrow AC \perp AD \rightarrow AB \perp AC \rightarrow AB \perp BC$$

$$BC \perp AD \rightarrow BD \perp AD \rightarrow \frac{BD}{AD} = \frac{BE}{BC} \rightarrow BD \perp BE \propto BC$$

$$\frac{BD}{AD} = BE \propto 9 \rightarrow BE = \frac{9}{1} = 9$$



$$AC \perp AD \rightarrow 14^2 + 14^2 = AC^2 \rightarrow AC = 14\sqrt{2}$$

$$14 \perp HC \propto 14 \rightarrow HC = \frac{14}{2} = 7 \rightarrow AH = 14$$

$$\Delta ADE \sim \Delta ABC \rightarrow \frac{AE}{AC} = \frac{DE}{BC} \rightarrow \frac{9}{14\sqrt{2}} = \frac{DE}{14} \rightarrow DE = \frac{9}{\sqrt{2}}$$

$$DE = \frac{9}{\sqrt{2}}$$