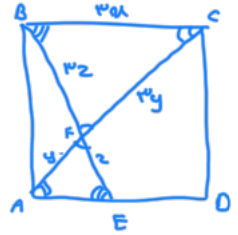


$ED = AE \rightarrow \frac{EF}{AF} ? \quad \Delta BFC \sim \Delta AFE \rightarrow \frac{BC}{AB} = \frac{CF}{AF} = \frac{BF}{EF}$

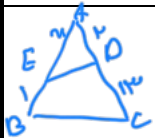


$\frac{EF}{AF} = \frac{CF}{AF} \rightarrow \frac{EF}{AF} = \frac{CF}{AF} \rightarrow EF = CF, BF = BF$

$AC^2 = (4\sqrt{2})^2 + (4\sqrt{2})^2 = 128 \rightarrow AC = 8\sqrt{2} \rightarrow \angle y = 45^\circ \rightarrow y = \frac{4\sqrt{2}}{2} = 2\sqrt{2}$

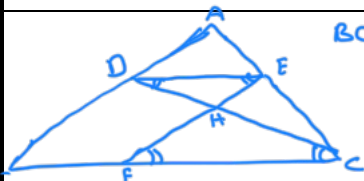
$BE^2 = (4\sqrt{2})^2 + 4^2 = 104 \rightarrow BE = 2\sqrt{26} \rightarrow \angle z = \sqrt{10} \rightarrow z = \frac{\sqrt{10}}{2}$

$\frac{EF}{AF} = \frac{z}{y} = \frac{\frac{\sqrt{10}}{2}}{2\sqrt{2}} \times \frac{8\sqrt{2}}{4\sqrt{2}} = \sqrt{\frac{10}{18}} = \sqrt{\frac{5}{9}}$



$\Delta AED \sim \Delta ABC \begin{cases} \angle E = \angle C \\ \angle A \rightarrow \angle A \end{cases} \Rightarrow \frac{AE}{AC} = \frac{AD}{AB} = \frac{ED}{BC} \rightarrow \frac{AE}{AC} = \frac{AD}{AB} = \frac{ED}{BC} \rightarrow \frac{AE}{AC} = \frac{AD}{AB} = \frac{ED}{BC} \rightarrow \frac{AE}{AC} = \frac{AD}{AB} = \frac{ED}{BC}$

$\Rightarrow \frac{AE}{AC} = \frac{AD}{AB} = \frac{ED}{BC} \rightarrow \frac{AE}{AC} = \frac{AD}{AB} = \frac{ED}{BC} \rightarrow \frac{AE}{AC} = \frac{AD}{AB} = \frac{ED}{BC} \rightarrow \frac{AE}{AC} = \frac{AD}{AB} = \frac{ED}{BC}$



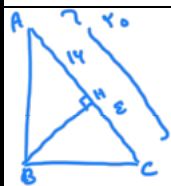
$BC = ? \quad BF = ? \quad \angle y = 45^\circ \quad DE \parallel BC \rightarrow \Delta ABC, \Delta DEF \rightarrow \frac{AD}{AB} = \frac{AE}{AC} = \frac{DE}{BC}$

$\frac{AD}{AB} = \frac{AE}{AC} = \frac{DE}{BC} \rightarrow \frac{AD}{AB} = \frac{AE}{AC} = \frac{DE}{BC} \rightarrow \frac{AD}{AB} = \frac{AE}{AC} = \frac{DE}{BC}$

$DE = \frac{9}{2} \rightarrow FC = \frac{18}{9} \rightarrow BC = \frac{18}{9}$

$\Delta DEH \sim \Delta FCH \rightarrow \frac{DF}{FC} = \frac{FH}{CH} = \frac{DH}{AC}$

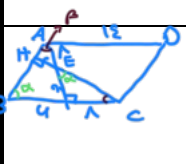
$\frac{DF}{FC} = \frac{FH}{CH} = \frac{DH}{AC} \rightarrow \frac{DF}{FC} = \frac{FH}{CH} = \frac{DH}{AC}$



$BC^2 = CH \times AC \rightarrow BC = \sqrt{2 \times 18} = 6\sqrt{2}$

$AB^2 = AH \times AC \rightarrow AB = \sqrt{14 \times 18} = 6\sqrt{2}$

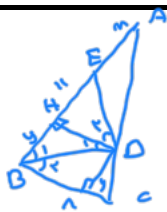
$\frac{BC}{AB} = \frac{1}{\sqrt{2}}$



$\Delta ABF \sim \Delta BCH \rightarrow \frac{BF}{BF} = \frac{CH}{AF} = \frac{BC}{AB} \sim \frac{BF}{BF} = \frac{CH}{AF} = \frac{BC}{AB} \sim \frac{BF}{BF} = \frac{CH}{AF} = \frac{BC}{AB}$

$\rightarrow \frac{m}{4} = \frac{1}{m+1} \rightarrow m^2 + 1m = 4 \rightarrow m^2 + 1m - 4 = 0 \rightarrow (m+1)(m-4) = 0 \rightarrow m = 4$

$\rightarrow m^2 + 1m - 4 = 0 \rightarrow (m+1)(m-4) = 0 \rightarrow m = 4$

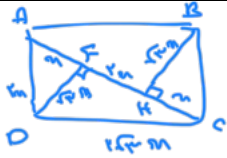


$$B_1 = B_2 \quad HD \parallel BC \rightarrow D_1 = B_2 \rightarrow DH = BH \quad H = 90^\circ \rightarrow B_1 = D_1, \angle E D_1 \rightarrow B_2 = \angle D_1$$

$$D E \parallel B \rightarrow EH \times BH = \frac{DH^2}{BH} \quad \frac{DH^2}{BH} = \frac{11}{4} \quad H = 90^\circ \rightarrow \frac{2 \times 11}{2 + 11} = \frac{11}{1} = \frac{11}{14}$$

$$\sim 11m \times 14m = 14m + 11 \rightarrow m = 4, 4$$

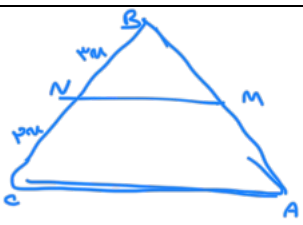
6



$$\frac{S_{ABCD}}{S_{BCH}} = \frac{AD \times DC}{\frac{1}{2} \times BH \times CH} = \frac{14m \times 14m}{\frac{1}{2} \times 14m \times 14m} = 1$$

$$BC^2 = HC \times AC \rightarrow BC = 7m$$

7

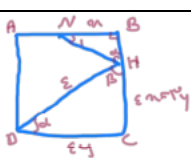


$$\frac{BC \times AB \times \sin \beta}{BN \times MB \times \sin \beta} = 1$$

$$\frac{2 \times 14 \times AB}{14 \times MB} = 1$$

$$\frac{AB}{MB} = \frac{1}{2} \quad \frac{BM}{AB} = \frac{2}{1} \rightarrow \frac{BM}{AM} = \frac{2}{1}$$

8



$$\alpha + \beta = 90^\circ = 180^\circ \rightarrow \alpha + \beta = 90^\circ$$

$$\rightarrow \Delta_{NHB} : 90^\circ + \alpha + N_1 = 180^\circ \rightarrow N_1 = 90^\circ - \alpha = \beta$$

$$\Delta_{DHC} : 90^\circ + \beta + D_1 = 180^\circ \rightarrow D_1 = 90^\circ - \beta = \alpha$$

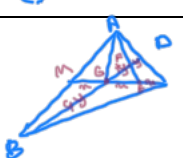
$$\Delta_{NHB} \sim \Delta_{DHC}$$

$$\frac{BN}{CH} = \frac{DH}{CD} = \frac{1}{2} \rightarrow \epsilon BH = CD \quad (BH = 4) \quad \epsilon BN = CH \quad (BN = 11)$$

$$\Rightarrow DH = 2 \times 4 = 8 \rightarrow 4 = \frac{8}{2} \rightarrow DC = 8 \times \frac{8}{2} = 14$$

$$S = \frac{14}{2} \times \frac{14}{2} = 49$$

9



$$BE = EC \quad \text{در مثلث BEC} \rightarrow \angle EBC = \angle ECB \rightarrow BD \parallel AB \parallel CM \rightarrow \text{در مثلث BEC} \rightarrow \angle EBC = \angle ECB$$

$$\rightarrow BE = EC = 14 \times 2 = 28$$

$$GF = 14 \times 2 = 28$$

$$\frac{BD}{FD} = \frac{14}{2} = 7$$

10