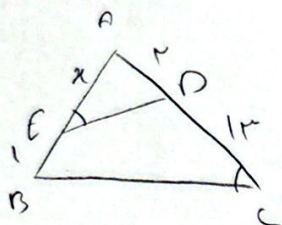
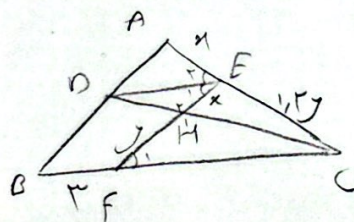


المساواة في المثلثات $\hat{C}_1 = \hat{A}_1$ } $\rightarrow \triangle BCF \sim \triangle AEF \rightarrow \frac{AE}{BC} = \frac{EF}{BF} = \frac{AF}{CF}$ -1

$AC^2 = 9x^2 + 9x^2 = 18x^2 \quad AC = 3\sqrt{2}x$
 $\hat{C}_1 = \hat{A}_1$ } $\rightarrow \triangle ADE \sim \triangle ABC \quad \frac{r}{n+1} = \frac{n}{16}$
 $\hat{C}_1 = \hat{A}_1$ } $\rightarrow \triangle ADE \sim \triangle ABC \quad \frac{r}{n+1} = \frac{n}{16}$
 $\frac{EF}{AF} = \frac{2}{9} \rightarrow \frac{\frac{3\sqrt{2}x}{2}}{\frac{3\sqrt{2}x}{9}} = \frac{r}{r} = \frac{r}{r}$



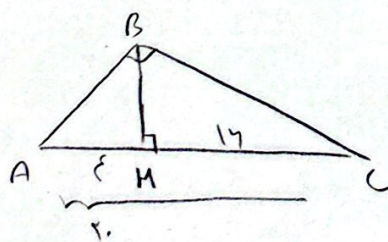
$\hat{A}_1 = \hat{A}_1$ } $\rightarrow \triangle ADE \sim \triangle ABC \quad \frac{r}{n+1} = \frac{n}{16}$
 $\hat{C}_1 = \hat{A}_1$ } $\rightarrow \triangle ADE \sim \triangle ABC \quad \frac{r}{n+1} = \frac{n}{16}$
 $n^2 + n - 16 = 0 \quad (n+1)(n-16) = 0 \rightarrow n = 16 \checkmark$
 $n = -1 \times$



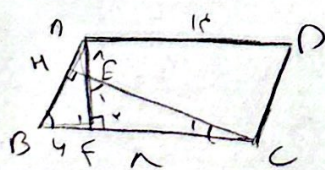
$\hat{H}_1 = \hat{H}_1$ } $\rightarrow \triangle DEH \sim \triangle FCH \quad \frac{DE}{FC} = \frac{x}{y} = \frac{r}{a}$
 $\hat{A}_1 = \hat{A}_1$ } $\rightarrow \triangle ADE \sim \triangle ABC \quad \frac{n}{n+1} = \frac{DE}{FC+r} = \frac{n}{n+1}$
 $\frac{n}{r_n} = \frac{1}{r}$

$\frac{DE}{FC} = \frac{r}{a} \quad \frac{DE}{FC+r} = \frac{1}{r}$

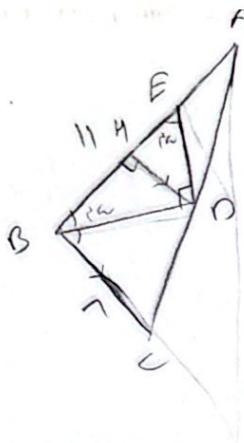
$\frac{FC+r}{FC} = \frac{9}{a} \quad aFC + 16 = 9FC \quad rFC = 16 \quad FC = \frac{16}{r}$
 $BC = \frac{16 \cdot 16}{r} = \frac{256}{r}$



$AB^2 = AH \times AC = 9 \times 16 = 144 \quad AB = 12$
 $AC^2 = 14 \times 16 = 224 \quad AC = 14\sqrt{2}$
 $\frac{AC}{AB} = \frac{14\sqrt{2}}{12} = \frac{7\sqrt{2}}{6}$



$\hat{C}_1 + \hat{E}_1 = 90^\circ$ } $\hat{E}_1 = \hat{B}$ } $\rightarrow \triangle FCE \sim \triangle ABF$
 $\hat{C}_1 + \hat{B}_1 = 90^\circ$ } $\hat{F}_1 = \hat{F}_1 = 90^\circ$ }
 $\frac{1}{n+EF} = \frac{EF}{4} \quad EF^2 + nEF - 16 = 0$
 $(EF+16)(EF-1) = 0 \rightarrow EF = 1 \checkmark$
 $EF = -17 \times$
 $AF = AE + EF = 14 + 1 = 15$



$$DH \parallel BC \xrightarrow{H:9} B=9. \rightarrow \hat{B}_1 = \hat{B}_2 = 18 \rightarrow \hat{E} = 18$$

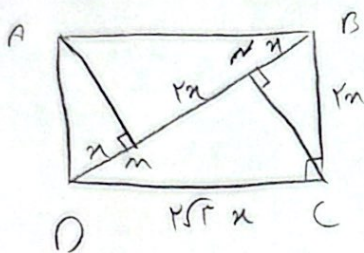
$$EH = DH = \frac{11}{9} \quad \text{و چون } DH \parallel BC \text{ پس } \triangle BDE \sim \triangle BDE$$

$$\frac{AH}{AB} = \frac{DH}{BC} \rightarrow \frac{AE + 11}{11 + 7} = \frac{11/9}{18}$$

$$9 \cdot 18 + 18 \cdot 11 = 18 \cdot AE + 18 \cdot 11$$

$$162 + 198 = 18 \cdot AE + 198$$

$$AE = 7, 7$$

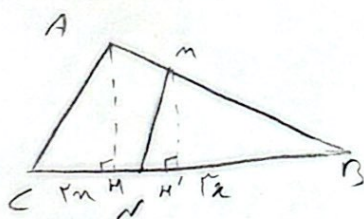


$$CM^2 = m \times n = n^2 \quad CM = \sqrt{n}$$

$$BC^2 = m \times n \quad BC = \sqrt{n}$$

$$CD^2 = 14n^2 - n^2 = 13n^2 \quad CD = \sqrt{13}n$$

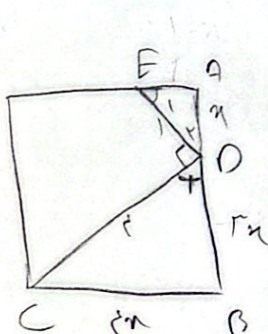
$$\frac{S_{ABCD}}{S_{BCN}} = \frac{\sqrt{n} \times \sqrt{13}n}{\frac{1}{2} \times \sqrt{n} \times n} = 1$$



$$\frac{S_{BMN}}{S_{ABC}} = \frac{m \times n}{AH \times 18} = \frac{1}{9}$$

$$\frac{m \times n}{AH} = \frac{18}{9} \xrightarrow{m \parallel AH} \frac{BM}{AB} = \frac{m}{AH} = \frac{1}{9}$$

$$\xrightarrow{\text{مقاطع متوازی}} \frac{BM}{AB - BM} = \frac{1}{9 - 1} \Rightarrow \frac{BM}{AM} = \frac{1}{8}$$



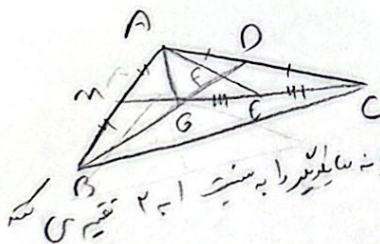
$$\left. \begin{array}{l} \hat{D}_1 + \hat{E}_1 = 9. \\ \hat{D}_1 + \hat{D}_2 = 9. \end{array} \right\} \rightarrow \hat{E}_1 = \hat{D}_1 \quad \left. \begin{array}{l} \hat{A}_1 = \hat{B}_1 = 9. \end{array} \right\} \xrightarrow{\text{پس}} \triangle ADE \sim \triangle BDC$$

$$\frac{AD}{BC} = \frac{AE}{BD} = \frac{ED}{CD} = \frac{1}{9}$$

$$9n^2 + 14n^2 = 14$$

$$23n^2 = 14 \quad n^2 = \frac{14}{23} \quad n = \frac{\sqrt{14}}{\sqrt{23}} \rightarrow \text{مساحت مربع} = \frac{14}{23}$$

$$S_{\text{مربع}} = \frac{14}{23}$$



۱- G محل تقاطع دو خط موازی است. پس BD و CM موازی اند.

از طرفی در مثل ABC و GDC دو خط موازی اند.

$$\frac{GD}{BD} = \frac{1}{9}$$

$$\frac{FD}{GD} = \frac{1}{9}$$

$$\frac{GD}{BD} \times \frac{FD}{GD} = \frac{FD}{BD} = \frac{1}{9} \rightarrow \frac{BD}{FD} = 9$$