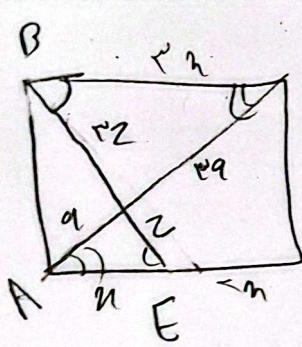




$$\left. \begin{matrix} \hat{C} = \hat{A} \\ \hat{F} = \hat{E} \end{matrix} \right\} \Rightarrow BFC \sim AFE$$

$$AC = \sqrt{1n^2 + 1n^2} = n\sqrt{2} = 2q \Rightarrow q = \frac{n\sqrt{2}}{2}$$

$$BE = \sqrt{r^2 + n^2} = n\sqrt{2} = 2r \Rightarrow r = \frac{n\sqrt{2}}{2}$$

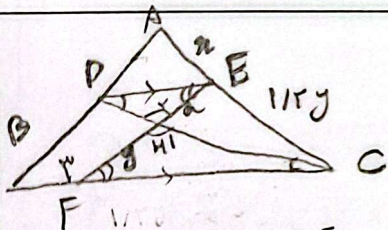
$$\frac{r}{q} = \frac{\frac{n\sqrt{2}}{2}}{\frac{n\sqrt{2}}{2}} = \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{\sqrt{2}}$$

$$\left. \begin{matrix} \hat{AEO} \sim \hat{AEB} \\ \hat{A} \text{ مشترک} \end{matrix} \right\} \Rightarrow \triangle ADE \sim \triangle ABC$$

$$\frac{AD}{AB} = \frac{AE}{AC} \rightarrow \frac{r}{n+1} = \frac{n}{1n} \Rightarrow r = n^2 + n$$

$$= n^2 + n - r = 0 \Rightarrow (n-0)(n+1) = 0$$

$$\left\{ \begin{matrix} n = 0 \\ n = -1 \end{matrix} \right. \checkmark$$



$$\Delta H = \Delta y \Rightarrow \frac{H}{y} = \frac{r}{n}$$

$$\left. \begin{matrix} \hat{D} = \hat{C} \\ \hat{E} = \hat{F} \\ H = H \end{matrix} \right\} \Rightarrow \triangle DEH \sim \triangle FCH$$

$$\rightarrow \frac{HE}{HF} = \frac{HD}{CH} = \frac{ED}{CF}$$

$$= \frac{r}{y} = \frac{r}{n} = \frac{DE}{FC}$$

$$\rightarrow DE = \frac{rFC}{n}$$

$$\frac{1}{r} = \frac{2}{1/r + n} \Rightarrow r^2 = n + 1/r \Rightarrow r = \frac{2n}{r}$$

$$rFC = 1 + nFC \Rightarrow FC = \frac{1}{r}$$

$$AC^2 = CH \cdot BC \rightarrow AC = \frac{AC^2}{r} = 20 \Rightarrow b^2 = r^2 \Rightarrow b = A\sqrt{2}$$

$$AB^2 = BH \cdot BC \rightarrow BM = \frac{AB^2}{r} = 1 - AB^2 = 10 \Rightarrow a = \sqrt{10}$$

$$\frac{AC}{AB} = \frac{1\sqrt{2}}{\sqrt{10}} = \frac{1}{\sqrt{2}} \Rightarrow \frac{AB}{AC}$$

$$\left. \begin{matrix} \hat{E}_1 + \hat{A}_1 = 10 \\ \hat{E}_2 + \hat{A}_1 = 10 \\ \hat{E}_1 = E_2 \end{matrix} \right\} \hat{C}_1 = A_1 \rightarrow \left. \begin{matrix} \hat{C}_1 = A_1 \\ F = 10 \end{matrix} \right\} \Rightarrow \triangle AFB \sim \triangle FCB$$

$$\frac{BF}{BF} = \frac{FC}{AF} = \frac{EC}{AB} \Rightarrow \frac{n}{q} = \frac{1}{1+n}$$

$$\left\{ \begin{matrix} n^2 + 1n = 1 \\ n^2 + 1n - 1 = 0 \\ (n+1)(n+1) \end{matrix} \right. \Rightarrow \left\{ \begin{matrix} n = 1 \\ n = -1 \end{matrix} \right. \checkmark$$

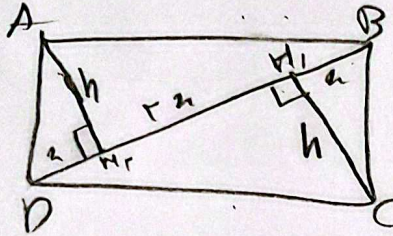
$$AF = AE + EF = 1 + \sqrt{2}$$

$$OH \parallel BC \rightarrow \hat{B} = \hat{A} = 90^\circ \quad B_1 = B_2 = \alpha = \frac{90}{r} \leq r\omega$$

$$ED = BD = 2 \rightarrow \hat{E} = \hat{B}_1 \quad \left. \begin{array}{l} EH = HD \\ MD = BH \end{array} \right\} \rightarrow EH = BM = \frac{11}{r} = 2/2$$

$$OH \parallel BC \xrightarrow{CC} \frac{AH}{AB} = \frac{AD}{AC} = \frac{MD}{BC} \xrightarrow{\Delta/\omega} \frac{2 + \frac{11}{r}}{2 + 11} = \frac{2/2}{2 + 11} \rightarrow 1 + \frac{11}{r} = \frac{2/2 + 11/2}{2 + 11}$$

$$\frac{2/2 + 11/2}{2 + 11} \Rightarrow 2 = 11/5$$



$$S_{ABCD} = r \times \left(\frac{r \cdot 2h}{r} \right) + r \times \left(\frac{2h}{r} \right) = r \cdot 2h + 2h \leq r \cdot 2h$$

$$S = S_{BCH_1} = S_{ADH_2} = \frac{2h}{r}$$

$$\frac{S_{\square}}{S_{\triangle ADH_2}} = \frac{r \cdot 2h}{\frac{2h}{r}} = \Delta$$

$$\angle BNM = \angle NMC \quad BN = \frac{r \cdot NC}{r}$$

$$BC = BN + NC = \frac{r \cdot h}{r} + h = \frac{a \cdot h}{r}$$

$$\frac{S_{APC}}{S_{MBN}} = \frac{\sin B \times AB \times BC}{\sin B \times BM \times BN} = r \Rightarrow \frac{AB}{BM} = \frac{r \times r}{a} = \frac{r}{a}$$

$$\frac{BM}{AB - BM} = \frac{a}{r - a} = \frac{a}{r} \Rightarrow \frac{BM}{AM} = \frac{a}{r}$$

$$\hat{B} = \hat{C} = 90^\circ$$

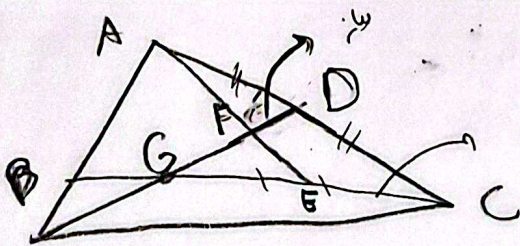
$$\left. \begin{array}{l} \hat{a} + \hat{b} = 90^\circ \\ \hat{b} + \hat{c} = 90^\circ \end{array} \right\} \Rightarrow \hat{a} = \hat{c}$$

$$\left. \begin{array}{l} \hat{a} + \hat{c} + \hat{d} = 180^\circ \\ \hat{a} + \hat{b} = 90^\circ \end{array} \right\} \Rightarrow \hat{d} = 90^\circ$$

$$\Rightarrow \triangle ECD \sim \triangle FBE \rightarrow$$

$$\frac{a \cdot DE}{BE} = \frac{EE}{FB} \leq r$$

$$a - \sqrt{15 - a} \rightarrow a = 15 - a - \sqrt{15 - a} \Rightarrow a = \frac{r \cdot a}{r \cdot a} = 10/r$$



$$\Rightarrow \frac{FD}{GF} = \frac{1k}{rk}$$

$$GD = rk \Rightarrow BG = 9k$$

$$\frac{BD}{FD} = \frac{9k + rk}{k} = 9$$