

$$\triangle AFE \sim \triangle BFC \rightarrow \frac{AE}{BC} = \frac{AF}{CF} = \frac{FE}{BF} = \frac{1}{3}$$

$$AC = 3\sqrt{2}n \rightarrow \frac{AF}{AC} = \frac{1}{3} \rightarrow AF = \frac{\sqrt{2}}{3}n$$

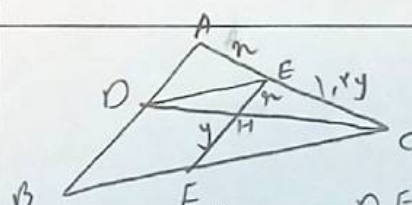
$$BE = \sqrt{2}n \rightarrow \frac{FE}{BE} = \frac{1}{3} \rightarrow FE = \frac{\sqrt{2}}{3}n$$

$$\frac{EF}{AF} = \frac{\frac{\sqrt{2}}{3}n}{\frac{\sqrt{2}}{3}n} = 1$$

$$\triangle AED \sim \triangle ACB \rightarrow \frac{ED}{BC} = \frac{AD}{AB} = \frac{AE}{AC} \rightarrow \frac{1}{n+1} = \frac{n}{12}$$

$$n^2 + n = 12 \rightarrow n^2 + n - 12 = 0 \rightarrow (n+4)(n-3) = 0 \rightarrow n = -4 \text{ یا } n = 3$$

$$n = 3$$

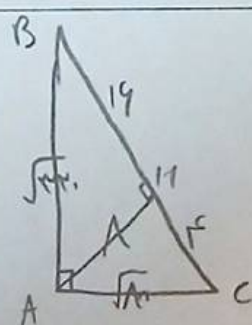


$$\triangle DHE \sim \triangle FHC \rightarrow \frac{DE}{FC} = \frac{HE}{HF} = \frac{DH}{HC} = \frac{1}{3} = \frac{1}{3} \rightarrow$$

$$DE = \frac{1}{3} FC$$

$$\text{و نیز: } \frac{n}{\frac{1}{3}n + n} = \frac{DE}{FC} \rightarrow \frac{n}{\frac{4}{3}n} = \frac{\frac{1}{3}FC}{FC} \rightarrow \frac{3}{4} = \frac{1}{3} \rightarrow FC = \frac{9}{4}n$$

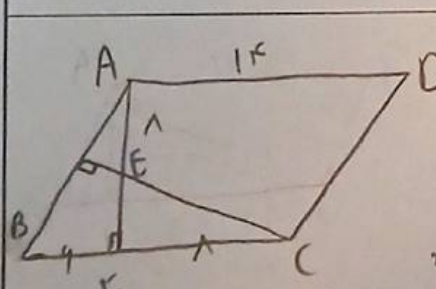
$$BC = FC + BF = \frac{9}{4}n + n = \frac{13}{4}n$$



$$AH^2 = CH \cdot BH \rightarrow n^2 = 4 \times 14 \rightarrow n = 14$$

$$\text{یا نیز: } n^2 + 1^2 = 10, 1^2 + 14^2 = 196$$

$$\frac{\sqrt{196}}{\sqrt{10}} = \sqrt{\frac{196}{10}} = \sqrt{19.6} = 4.43$$

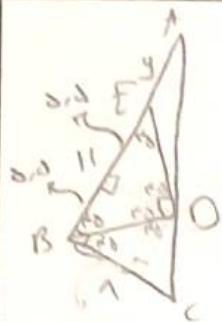


$$\begin{cases} \hat{C} + \hat{B} = 90^\circ \\ \hat{B} + \hat{A} = 90^\circ \end{cases} \rightarrow \hat{C} = \hat{A}, \hat{F} = \hat{E} \Rightarrow \triangle ABF \sim \triangle ECF$$

$$\frac{CE}{AB} = \frac{EF}{BF} = \frac{FC}{AF} \sim \frac{EF}{4} = \frac{1}{12+EF} \rightarrow \frac{EF}{4} = \frac{1}{12+EF}$$

$$n^2 + 12n - 48 = 0 \rightarrow (n+12)(n-4) = 0 \rightarrow n = -12 \text{ یا } n = 4 \rightarrow EF = 4$$

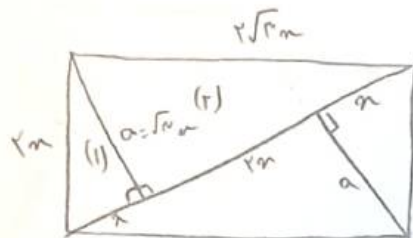
$$AF = 12 + 1 = 13$$



$BDE \sim \text{مثلثي متساوي الساقين}$

$$\frac{y + 0.5}{11 + y} = \frac{0.5}{1} \rightarrow 1y + 0.5 = 0.5 + 0.5y \rightarrow 0.5y = 0.5 \rightarrow y = 1$$

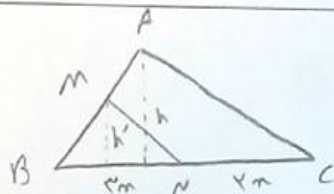
$$AE = 1.5$$



$$\text{مثلث (1)} \sim \text{مثلث (2)} \rightarrow \frac{n}{a} = \frac{a}{\sqrt{2}n} \rightarrow a^2 = \sqrt{2}n^2 \rightarrow a = \sqrt{2}n$$

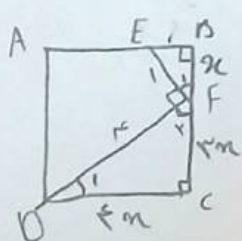
$$\text{طبق مبرهنة فيثاغورس: } (\sqrt{2}n)^2 + (n)^2 = 14n^2 \rightarrow \sqrt{2}n = 1$$

$$\frac{\sqrt{2}n \times n}{\frac{n \sqrt{2}n}{2}} = 1$$



$$\frac{ABC}{BNM} = 4 \Rightarrow \frac{h \times 2n}{h' \times n} = 4 \rightarrow \frac{h}{h'} = 2$$

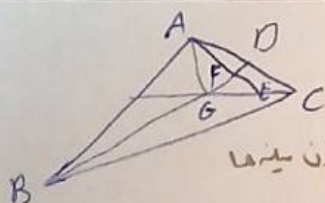
$$\frac{h'}{h} = \frac{BM}{AB} \rightarrow \frac{1}{2} = \frac{BM}{AB} \rightarrow \frac{BM}{AM} = \frac{1}{2}$$



$$\left. \begin{array}{l} \hat{F}_1 + \hat{F}_2 = 90^\circ \\ \hat{F}_2 + \hat{D}_1 = 90^\circ \end{array} \right\} \rightarrow \hat{F}_1 = \hat{D}_1 \rightarrow EFB \sim FCD$$

$$\Rightarrow \frac{EF}{FD} = \frac{EB}{FC} = \frac{BF}{CD} \rightarrow \frac{1}{2} = \frac{EB}{FC} = \frac{BF}{CD}$$

$$9n^2 + 14n^2 = 14 \rightarrow 23n^2 = 14 \rightarrow n = \frac{14}{23} \rightarrow \frac{1}{2} = \frac{2 \times 14}{23}$$



$$\frac{BD}{FD} = ?$$

در مثلث AGC، F نقطه تقاطع خطوط AG و BC است.

$$\frac{GD}{FD} = 4$$

$$\frac{BD}{GO} = 4$$

$$\frac{BD}{FD} = \frac{BD}{GD} \times \frac{GD}{FD} \quad 4 \times 4 = 16$$

طول BD