

$$ED = 2AE$$

$$\frac{AE}{ED} = \frac{1}{2} \rightarrow \frac{EA}{AD} = \frac{1}{3} \xrightarrow{AD=BC} \frac{AE}{BC} = k = \frac{1}{3} \rightarrow \frac{AF}{FC} = \frac{FE}{FB} = \frac{1}{3} \Rightarrow \frac{FE}{FE+FB} = \frac{1}{4} \Rightarrow \frac{FE}{BC} = \frac{1}{4}$$

$$EB = \sqrt{10}$$

$$\triangle AEF \sim \triangle FBC$$

$$\xrightarrow{BE=\sqrt{10}} \frac{FE}{\sqrt{10}} = \frac{1}{4} \Rightarrow \frac{\sqrt{10}}{4} = EF$$

$$\hat{E} = \hat{C} \Rightarrow \left\{ \begin{array}{l} \text{(ii)} \triangle ABC \sim \triangle AEO \Rightarrow \frac{2}{x+1} = \frac{x}{14} \rightarrow 28 = x^2 + x \rightarrow x^2 + x - 28 = 0 \rightarrow \end{array} \right.$$

$$\frac{AE}{AC} = \frac{AD}{AB} = \frac{DE}{BC} \rightarrow \frac{x}{x+1} = \frac{DE}{14} \rightarrow BC = \frac{(x+1)(x-4)}{14} = 0 \Rightarrow \left\{ \begin{array}{l} x = -4 \text{ یا } x = 4 \\ x = 4 \end{array} \right.$$

$$\triangle DHE \sim \triangle CHF \rightarrow \frac{EH}{FH} = \frac{DH}{CH} = \frac{DE}{CF} \rightarrow \frac{4}{x} = \frac{DE}{CF} \rightarrow CF = \frac{x}{4} DE$$

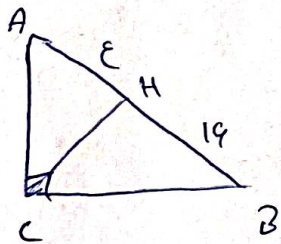
$$\textcircled{1}, \textcircled{4} \rightarrow BC = BF + CF \rightarrow DE = \frac{4}{x} \quad BC = x \times \frac{4}{x} = 4\sqrt{10}$$

$$x = \frac{2}{\omega} y \rightarrow DE \parallel BC \xrightarrow{\text{CWT}} \frac{AE}{AC} = \frac{DE}{BC} \Rightarrow \frac{EH}{FH} = \frac{DE}{FC} \Rightarrow \frac{x}{y} = \frac{2}{\omega} \Rightarrow \frac{FC}{DE} = \frac{\omega}{2} \textcircled{1}$$

$$\Rightarrow \frac{\frac{2}{\omega} y}{\frac{4}{\omega} y} = \frac{1}{2} = \frac{DE}{BC} \textcircled{2}$$

$$\textcircled{1}, \textcircled{2} \Rightarrow \frac{BC}{DE} = \frac{2 + FC}{DE} = \frac{2}{1} \Rightarrow \frac{2}{DE} + \frac{\omega}{2} = 2$$

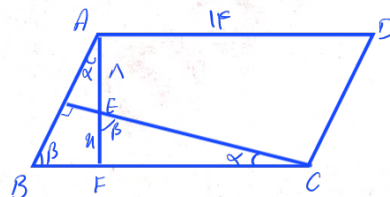
$$\hookrightarrow DE = \frac{4}{\omega} \quad BC = \frac{4}{\omega} + 2 = \frac{14}{\omega}$$



$$AC^2 = AH \times AB \rightarrow AC = \sqrt{140}$$

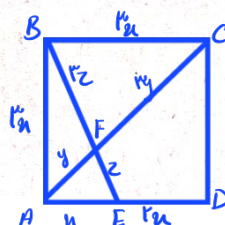
$$BC^2 = 10 \times 14 \rightarrow BC = \sqrt{140}$$

$$\frac{BC}{AC} = \sqrt{\frac{140}{140}} = 1$$



$$\frac{2}{4} = \frac{1}{x+1} \rightarrow x = 1$$

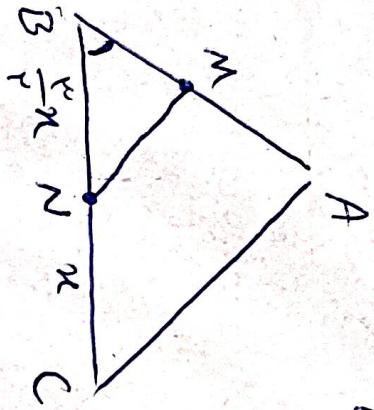
$$AF = 1 + 1 = 2$$



$$BE^2 = (1^2) + (1^2) \rightarrow BE = \sqrt{2} \rightarrow 2 + 1 = \sqrt{2} \rightarrow 2 = \frac{\sqrt{2}}{2}$$

$$(AC)^2 = (1^2) + (1^2) \rightarrow AC = \sqrt{2} \rightarrow EF = \sqrt{2} \rightarrow y = \frac{\sqrt{2}}{2}$$

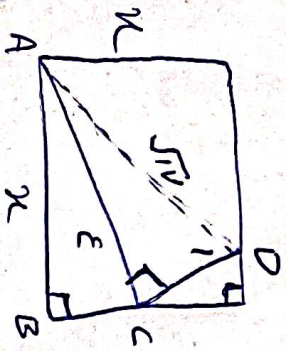
$$\frac{EF}{AF} = \frac{2}{2} = 1$$



$$\triangle ABC \sim \triangle BMN \Rightarrow \frac{MN}{AC} = \frac{BN}{BC} = \frac{MB}{AB} = \frac{\frac{1}{r}x}{\frac{1}{r}x} = \frac{1}{r} = k$$

$$\frac{S_{ABC}}{S_{BMN}} = \frac{\frac{1}{2} \times AB \times BC \times \sin B}{\frac{1}{2} \times BM \times BN \times \sin B} = k^2$$

$$\frac{AB}{BM} = \frac{1}{k} \rightarrow \frac{AB - BM}{BM} = \frac{1}{k} \rightarrow \frac{AM}{BM} = \frac{1}{k}$$



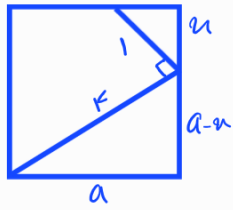
$$\angle C = \angle B = 90^\circ \Rightarrow \triangle ABC \sim \triangle ACD$$

$$\frac{AC}{AD} = \frac{BC}{AC} \rightarrow \frac{x}{\sqrt{14}} = \frac{x}{x} \rightarrow x = \frac{14}{\sqrt{14}}$$

$$2.5x = 14 \Rightarrow \frac{14}{14} = \frac{14}{14}$$

0.17

0.17



$$\frac{y}{a-u} = \frac{x}{a} = \frac{1}{r} \rightarrow \begin{cases} a - r u \\ a - u = r y \end{cases}$$

(9)

$$r u - u = r y \rightarrow u = \frac{r y}{r - 1}$$

$$r = (a - u) + a \rightarrow u = \frac{r}{2}, a = \frac{14}{5}$$

$$S_{\square} = a^2 = \frac{r \omega^4}{r \omega}$$