

۱- $\triangle BFC \sim \triangle AFE$ ثابت $\frac{1}{3}$ من $\frac{AE}{BC} = \frac{1}{3}$

حالت بافتادوس $AC = \sqrt{BC^2 + CD^2} = \sqrt{(2x)^2 + x^2} = \sqrt{5x^2} = x\sqrt{5}$
 $BE = \sqrt{AB^2 + AE^2} = \sqrt{4x^2 + x^2} = x\sqrt{5}$

$\frac{AF}{FC} = \frac{1}{2} \Rightarrow \frac{x}{2x-x} = \frac{1}{2} \Rightarrow AF = \frac{x\sqrt{5}}{3}$

$\frac{EF}{EB} = \frac{1}{3} \Rightarrow \frac{y}{x\sqrt{5}-y} = \frac{1}{3} \Rightarrow EF = \frac{x\sqrt{5}}{6}$

$\Rightarrow \frac{EF}{AF} = \frac{\frac{x\sqrt{5}}{6}}{\frac{x\sqrt{5}}{3}} = \frac{1}{2}$

۲- $\hat{E} = \hat{C}$ (مردت سوال)
 $\hat{A} = \hat{A}$ (شترن) $\Rightarrow \triangle ADE \sim \triangle ABC$

$\frac{AD}{AB} = \frac{AE}{AC}$

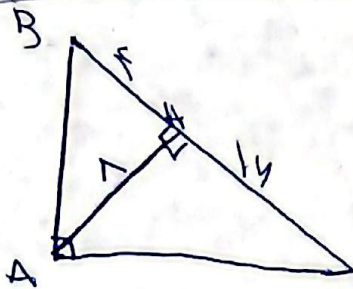
$\Rightarrow \frac{2}{x+1} = \frac{x}{10} \Rightarrow x^2 + x - 20 = 0 \Rightarrow (x+5)(x-4) = 0$
 $x = 4$ (غیر منفی)

۳- طبق سوال $\triangle DEH \sim \triangle FHC$ و $\frac{EH}{FH} = \frac{3}{5}$
 حالت $\frac{DE}{DC}$ $x = 4$ و $y = 4$

$\frac{AE}{AC} = \frac{DE}{BC} \Rightarrow \frac{DE}{BC} = \frac{1}{3} \Rightarrow DE = \frac{BC}{3}$

$DE = \frac{BC-9}{3} \Rightarrow \frac{BC-9}{3} = \frac{BC}{3} \Rightarrow BC = 9$

$\Rightarrow DE = DE \Rightarrow \frac{BC-9}{3} = \frac{BC}{3} \Rightarrow BC = 9$



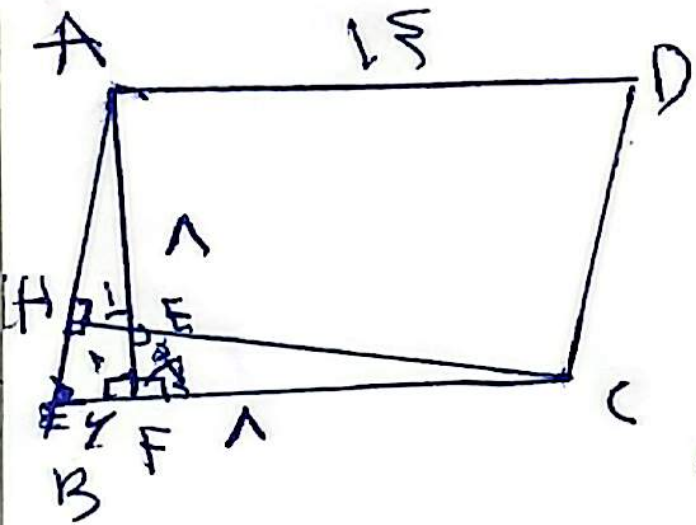
۴- $AB^2 = AH \cdot AC = 14 \cdot AC \Rightarrow AB = \sqrt{14 \cdot AC}$

$\Rightarrow AB^2 = AH^2 + BH^2 \Rightarrow AB = \sqrt{14 \cdot AC}$

~~$AB^2 = AH^2 + BH^2$~~

$AB^2 + AC^2 = BC^2 \Rightarrow AC^2 + BC^2 = AB^2$

$\Rightarrow 1400 - 100 = AC^2 \Rightarrow AC = \sqrt{1300}$



$$\left. \begin{array}{l} E_1 = E_2 \text{ (مقابلہ)} \\ H = F = 90^\circ \end{array} \right\} \Rightarrow \triangle AHE \sim \triangle FEC$$

$$\left. \begin{array}{l} C = C \text{ (مقابلہ)} \\ H = F = 90^\circ \end{array} \right\} \Rightarrow \triangle BHC \sim \triangle FEC$$

$$\text{مس } \left. \begin{array}{l} B = E \\ F_1 = F_2 = 90^\circ \end{array} \right\} \triangle ABF \sim \triangle FEC$$

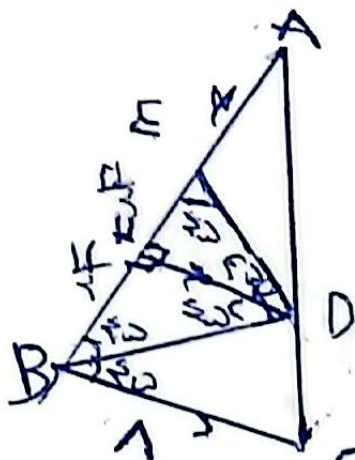
$$\frac{AF}{CF} = \frac{BF}{EF} \Rightarrow \frac{1+x}{1} = \frac{x}{x} \Rightarrow x + 1 = x$$

$$\Rightarrow (x+1) - x = 0 \Rightarrow 1 = 0$$

$$\Rightarrow x = -1 \text{ (مردود)}$$

$$\Rightarrow x = \sqrt{1}$$

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



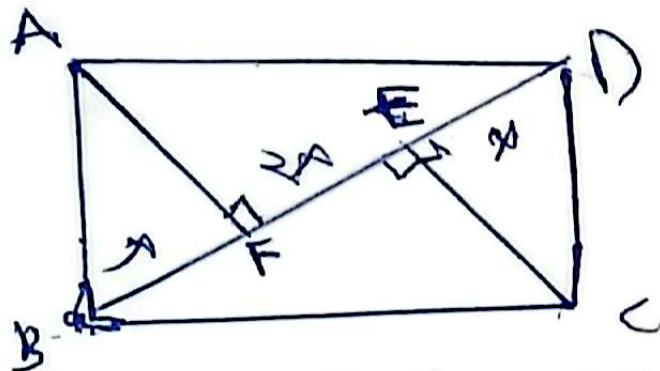
$$HD \parallel BC \Rightarrow B = 90^\circ$$

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$$\frac{AH}{AB} = \frac{HD}{BC} \Rightarrow \frac{x + \frac{11}{2}}{x + 11} = \frac{11}{1}$$

چون مثلث متساوی الساقین کا سر الزامیہ است ارتفاع دارد بزرگتر نصف دو برابر HD است

$$\Rightarrow 11x + 55 = \frac{11x}{2} + \frac{121}{2} \Rightarrow x = \frac{44}{10}$$



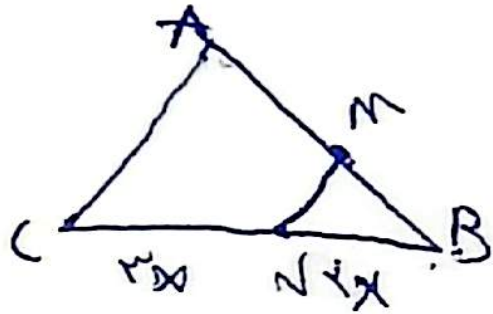
$$\triangle EDC \sim \triangle AFB$$

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$$\triangle AFD \sim \triangle BEC$$

پس مساحت مستطین برابر جمع مساحت های متساوی
مثلث های AFD و EDC است

$$S_{\text{مستطیل}} = 2 \left(\frac{CE \times \frac{11}{2}}{\frac{11}{2}} + \frac{CE \times \frac{11}{2}}{\frac{11}{2}} \right) \Rightarrow \frac{11}{2} = 1$$

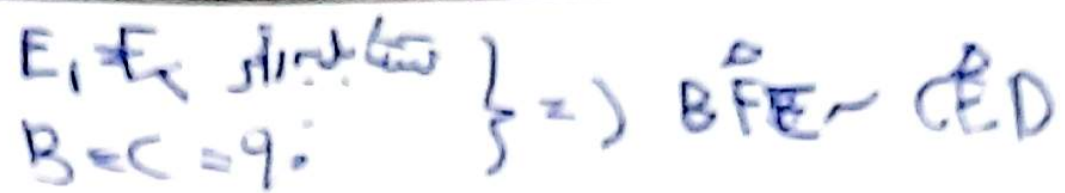


$$S_{\Delta ABC} = r S_{\Delta BMN}$$

$$\Rightarrow \frac{1}{r} \times \sin B \times \omega \times AB = r \times \frac{1}{r} \times \sin B \times BM \times \frac{1}{r}$$

$$\Rightarrow \frac{AB}{BM} = \frac{r}{\omega} \Rightarrow \frac{BM}{AB} = \frac{\omega}{r} \Rightarrow \frac{BM}{AM+BM} = \frac{\omega}{r}$$

$$\Rightarrow \frac{AM+BM}{BM} = \frac{r}{\omega} \Rightarrow \frac{AM}{BM} + 1 = \frac{r}{\omega} \Rightarrow \frac{AM}{BM} = \frac{1}{\omega} \Rightarrow \frac{BM}{AM} = \omega$$



$$f(x) = \frac{1}{x} \Rightarrow y = \frac{1}{x}$$

$$-x^2 + y^2 = 1 \Rightarrow x^2 + \frac{9}{16}x^2 = 7 \Rightarrow \frac{25}{16}x^2 = 1 \Rightarrow x = \pm \frac{4}{5}$$

$$14x \rightarrow 14x \frac{14}{14} \rightarrow \boxed{\frac{14x}{14}}$$