

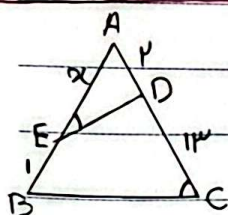
$\hat{F}_1 = \hat{F}_2$ زوایای مقابل بهایس } $\Rightarrow \triangle AFE \sim \triangle BFC$ $\hat{B}_1 = \hat{E}_1$ خطوط موازی و مورب } $\Rightarrow$ نسبت تناسب $\hat{A} = \hat{C}$

①

$$AB^2 + AE^2 = BE^2 \rightarrow BE = \sqrt{10}x \rightarrow EF = z = \frac{\sqrt{10}}{5}x$$

$$AD^2 + CD^2 = AC^2 \rightarrow AC = \sqrt{11}x = 4y \rightarrow AF = y = \frac{\sqrt{11}}{4}x$$

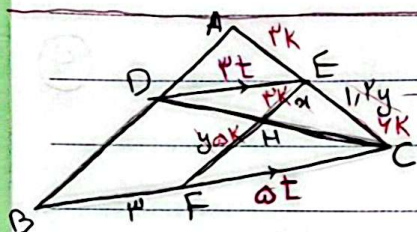
$$\frac{EF}{AF} = \frac{\frac{\sqrt{10}}{5}x}{\frac{\sqrt{11}}{4}x} = \frac{\sqrt{40}}{\sqrt{11}} = \frac{2\sqrt{10}}{\sqrt{11}}$$



$\hat{A} = \hat{A}$ زاویه مشترک } $\Rightarrow \triangle AED \sim \triangle ABC$ $\hat{E} = \hat{C}$ زوایای متساوی

②

$$\frac{x}{x+1} = \frac{x}{10} \rightarrow x(x+1) = 10 \rightarrow x = 2$$

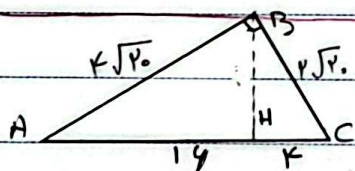


$$x = 3K / y = 4K \quad \frac{3t}{3+4t} = \frac{4K}{4+4K} = \frac{1}{2}$$

③

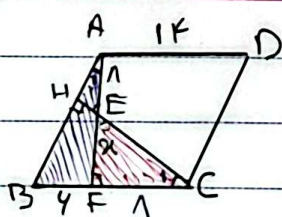
$$9t = 3 + 4t \Rightarrow t = \frac{3}{5} \rightarrow 4t = \frac{12}{5}$$

$$BC = 3 + 4t = \frac{24}{5}$$



$$BC^2 = CH \times AC \rightarrow BC = \sqrt{10} \quad AB^2 = AH \times AC \rightarrow AB = \sqrt{10} \quad \frac{AB}{BC} = \frac{\sqrt{10}}{\sqrt{10}} = 1$$

④

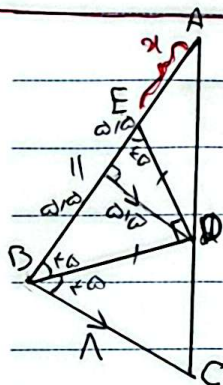


$E_1 = E_2$ و $\hat{F}_1 = \hat{F}_2 = 90^\circ \Rightarrow \hat{A}_1 = \hat{A}_2$
 $\hat{A}_1 = \hat{A}_2$ } $\Rightarrow \triangle ABF \sim \triangle EFC$ $\hat{F}_1 = \hat{F}_2$

$$\frac{EC}{AF} = \frac{EF}{BF} \Rightarrow \frac{1}{1+x} = \frac{x}{4}$$

$$\Rightarrow x = 1 \rightarrow AF = 1 + 1 = 2$$

⑤



$$\frac{11+x}{11} = \frac{1}{1} \Rightarrow x = 1$$

⑥

$$BF^2 = x(1/4) \rightarrow BF = \sqrt{1/4}x$$

$$\frac{S_{\square ABEF}}{S_{\triangle BFC}} = \frac{1 \times S_{\triangle ABC}}{S_{\triangle BFC}} = \frac{1 \left(\frac{1}{2} \right) (\sqrt{1/4}x)(x)}{\left(\frac{1}{2} \right) (\sqrt{1/4}x)(x)} = 1$$

$$MN' \parallel AM$$

$$\frac{S_{\triangle MBN}}{S_{\triangle ABC}} = \frac{MN' \times \sqrt{1/4}x}{AH \times \omega x} = \frac{1}{9} \rightarrow \frac{MN'}{AH} = \frac{\omega}{9} \rightarrow \frac{BM}{AB} = \frac{MN'}{AH} = \frac{\omega}{9}$$

$$\frac{BM}{AB - BM} = \frac{\omega}{9 - \omega} \rightarrow \frac{BM}{AM} = \frac{\omega}{4}$$

$$\hat{B} = \hat{C} = 90^\circ \Rightarrow \triangle EBF \sim \triangle FCD$$

$$\frac{z}{x-y} = \frac{y}{x} = \frac{1}{4} \Rightarrow yz = \frac{x}{4} \Rightarrow z = \frac{\sqrt{1/4}x}{14}$$

$$DF^2 = x^2 + \frac{9}{14}x^2 = 14 \rightarrow x^2 = \frac{(14)^2}{(\omega)^2} = 9$$

$$FD = \frac{1}{\sqrt{2}} GD, \quad GD = \frac{1}{\sqrt{2}} BD \Rightarrow \frac{BD}{FD} = \frac{\sqrt{2} GD}{\frac{1}{\sqrt{2}} GD} = 2$$