

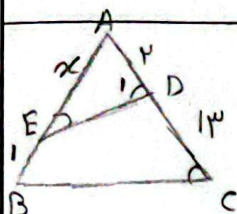
$$BE^P = 9x^P + x^P = 10x^P \rightarrow B = \sqrt{10}x \quad AC^P = 18x^P \rightarrow AC = 3\sqrt{2}x$$

$$\left. \begin{array}{l} \hat{C}_1 = \hat{A}_1 \\ \hat{E}_1 = \hat{B}_1 \\ F_1 = F_2 \end{array} \right\} \Rightarrow \frac{\triangle AEF}{k=3} \sim \frac{\triangle BFC}{\text{نسبة}} \Rightarrow \begin{cases} AF = \frac{1}{3} FC \\ EF = \frac{1}{3} BF \end{cases}$$

$$\rightarrow f y = \sqrt{10} x \rightarrow y = \frac{\sqrt{10}}{f} x$$

$$\rightarrow FZ = 3\sqrt{2}x \rightarrow Z = \frac{3\sqrt{2}}{4}x$$

$$\frac{EF}{AF} = \frac{2}{2} = \frac{\frac{\sqrt{10}}{2}}{\frac{3\sqrt{2}}{2}} = \frac{\sqrt{10}}{3\sqrt{2}} = \frac{\sqrt{5}}{3}$$

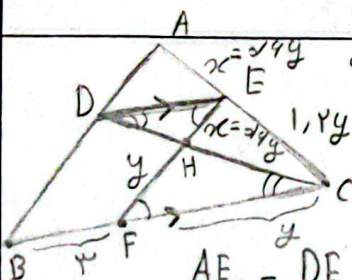


$$\left. \begin{array}{l} \hat{A} = \hat{A} \\ \hat{E} = \hat{C} \end{array} \right\} \Rightarrow \hat{A} \hat{E} D \sim \hat{A} \hat{C} B \Rightarrow D_1 = \hat{B}$$

$$\frac{\text{لوحه}}{\text{بزرگ}}: \frac{2}{x+1} = \frac{x}{14} \rightarrow x^2 + x = 30 \rightarrow x^2 + x - 30 = 0$$

$$(x+6)(x-4) = 0$$

→ $x \begin{cases} \nearrow -9x \\ \searrow \end{cases} \rightarrow \boxed{x=0} \checkmark$



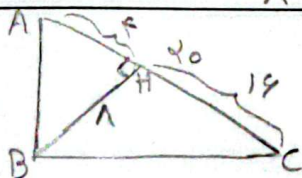
$$\left. \begin{array}{l} C_1 = D_1 \\ F_1 = E_1 \\ H_1 = H_p \end{array} \right\} \Rightarrow BEH_p \sim CFH_1$$

$$w_y = \omega x$$

$$x = \frac{w}{b} \quad y = 0.14y \quad (r)$$

$$\frac{AE}{AC} = \frac{DE}{BC} \rightarrow \frac{0.142}{1.142} = \frac{0.142}{r+y} \rightarrow 1.142 = r+y \rightarrow 0.142 = r$$

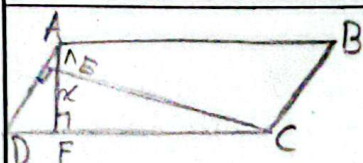
$$BC = V + Y = \frac{YF + Y_0}{1} = \frac{YF}{1} + \frac{YV}{F} = \frac{YV_0}{100} = \boxed{Y, V_0} \quad \checkmark$$



$$BH^Y = F \times 19 = 4F \Rightarrow BH = 1$$

$$BA^T = 19 + 4f = 10 \rightarrow BA = \sqrt{10} = \sqrt{f \sqrt{d}}$$

$$Bc^r = 4d4 + 4f = 4Y_0 \rightarrow Bc = \sqrt{4Y_0} = \sqrt{4\sqrt{d}}$$



$$\left. \begin{array}{l} A_1 = C_1 \\ D = E_1 \\ F_1 = F_2 \end{array} \right\} \Rightarrow \overset{A}{ABF} \sim \overset{A}{CEF}$$

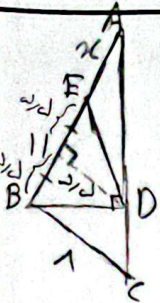
$$\rightarrow \frac{1+x}{1} = \frac{9}{x} \rightarrow x^2 + 1x = 9$$

$$X^T A X - F A = 0$$

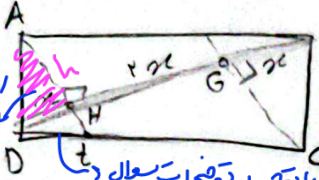
$$(x+12)(x-5) = 0 \rightarrow x = -12 \quad \checkmark$$

$$AF = A + F = 12$$

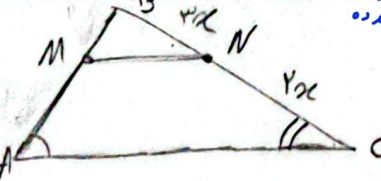
$\hat{B} = \hat{H} = 90^\circ \Rightarrow \hat{B}_1 = \hat{B}_2 = 45^\circ$: برای این: AB بر خط HD عمود است بنابراین: $\hat{B}_1 = \hat{B}_2 = 45^\circ \Rightarrow \hat{E}_1 = \hat{E}_2$
 $H = 90^\circ \Rightarrow \hat{D}_1 = \hat{D}_2 = 45^\circ \Rightarrow \hat{E}_1 = \hat{E}_2$ پس مثلث BDF قائم الزامیه متساوی الساقین است
 بنابراین: $DH^2 = BH \times HE = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4} \Rightarrow DH = \frac{1}{2}$
 $HD \parallel BC \Rightarrow \frac{x + \frac{1}{2}}{x + 1} = \frac{\frac{1}{2}}{1} \Rightarrow 1x + \frac{1}{2} = \frac{1}{2}x + \frac{1}{2} \Rightarrow \frac{1}{2}x = 0 \Rightarrow x = 0$ (اینجا خطای محاسباتی در تصویر دیده می‌شود)
 $\rightarrow 2x = 1 \Rightarrow x = \frac{1}{2}$



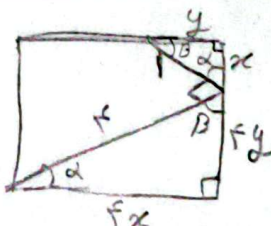
$AH^2 = 3x \times x = 3x^2 \rightarrow AH = \sqrt{3}x$
 $AB^2 = 3x \times 4x = 12x^2 \rightarrow AB = 2\sqrt{3}x$
 $AD^2 = x \times 4x = 4x^2 \rightarrow AD = 2x$
 $\frac{x}{\sqrt{3}x} = \frac{y}{2x} \rightarrow \frac{1}{\sqrt{3}} = \frac{y}{2} \rightarrow y = \frac{2}{\sqrt{3}}$
 $S_{DHE} = \frac{x}{\sqrt{3}} \times x = \frac{x^2}{\sqrt{3}}$
 $S_{ABCD} = \frac{1}{2} \times 2\sqrt{3}x \times 2x = 2\sqrt{3}x^2$
 $\frac{S_{DHE}}{S_{ABCD}} = \frac{\frac{x^2}{\sqrt{3}}}{2\sqrt{3}x^2} = \frac{1}{6}$



$\frac{S_{BMN}}{S_{ABC}} = \frac{BM \times BN \times \cos \theta}{BC \times AB \times \cos \theta} = \frac{BM}{AB} \times \frac{BN}{BC} = \frac{1}{3}$
 $\rightarrow \frac{BM}{AB} = \frac{1}{9} \rightarrow \frac{BM}{AM} = \frac{1}{8}$



$4y + x = 4x \rightarrow 4y = 3x \rightarrow y = \frac{3}{4}x$
 $x^2 + y^2 = 1 \rightarrow x^2 + \frac{9}{16}x^2 = 1 \rightarrow \frac{25}{16}x^2 = 1 \rightarrow x^2 = \frac{16}{25} \rightarrow x = \frac{4}{5}$
 $y = \frac{3}{4} \times \frac{4}{5} = \frac{3}{5}$
 $S_{\text{مربع}} = 4x \times 4x = 16x^2 = 16 \times \frac{16}{25} = \frac{256}{25}$



$GD = \frac{1}{3}BD$ — محل هری سه میانه است
 $FD = \frac{1}{3}GD \rightarrow FD = \frac{1}{9}BD$

