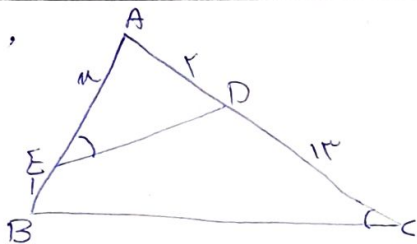


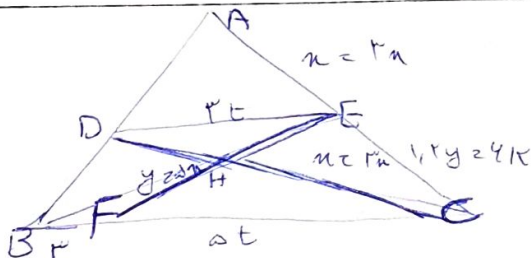
$BFC \sim AFE$
 $AC = \sqrt{2+2} = 2\sqrt{2} = 2y \Rightarrow y = \sqrt{2}$
 $BE = \sqrt{1+1} = \sqrt{2} = 2x \Rightarrow x = \frac{\sqrt{2}}{2}$
 $\frac{x}{y} = \frac{\frac{\sqrt{2}}{2}}{\sqrt{2}} = \frac{\sqrt{2}}{2\sqrt{2}} = \frac{\sqrt{2}}{2}$

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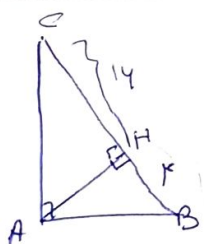
$ADE \sim ABC$
 $\frac{y}{x+1} = \frac{x}{10} \Rightarrow x(x+1) = 10$
 $x = 2$

۲



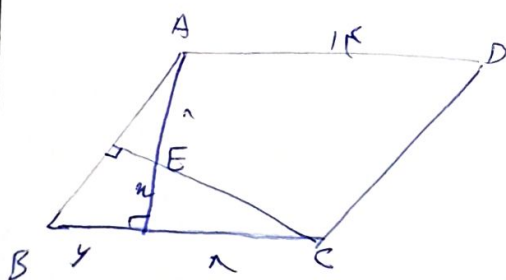
$\frac{y}{2} = \frac{x}{3} = k \Rightarrow y = 2k, x = 3k$
 $\frac{3k}{3+2k} = \frac{2k}{2k+3k} = \frac{1}{3} \Rightarrow$
 $9k = 3+2k \Rightarrow 7k = 3 \Rightarrow k = \frac{3}{7}$
 $BC = 4 + 2 \times \frac{3}{7} = \frac{34}{7}$

۳



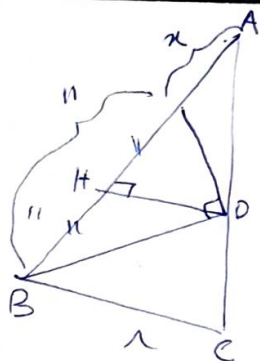
$BC = 5$
 $HB = 3$
 $AB, AC = ?$
 $AB^2 = CH \times BC = 1 \times 5 = 5 \Rightarrow AB = \sqrt{5}$
 $AC^2 = BH \times BC = 4 \times 5 = 20 \Rightarrow AC = \sqrt{20} = 2\sqrt{5}$
 $AC = 2\sqrt{5}$
 $\frac{AC}{AB} = \frac{2\sqrt{5}}{\sqrt{5}} = 2$

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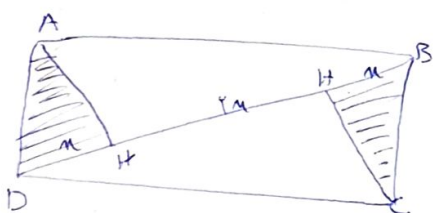
$\hat{A}_1 = \hat{A}_2, \hat{E}_1 = \hat{E}_2 \Rightarrow \triangle ABF \sim \triangle EFC$
 $\frac{FC}{AF} = \frac{EF}{BF} \Rightarrow \frac{1}{1+x} = \frac{x}{y} \Rightarrow x^2 + 11x - 6 = 0$
 $\Rightarrow (x+12)(x-1) = 0 \Rightarrow x = -12 \text{ or } x = 1$
 $x = 1 \Rightarrow AF = 1 + 6 = 7$

۵



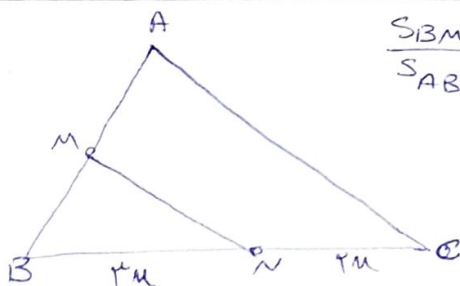
$BH \parallel BC, H = 90^\circ \Rightarrow \angle B = 90^\circ \xrightarrow{BD} \alpha = 45^\circ$
 $BD = DE$ نسباً
 $\triangle BDE$ مساواة
 $BH = EH = \frac{1}{2}$ نصف وتر
 $DH \parallel BC \xrightarrow{\text{نقطة}} \frac{AH}{AB} = \frac{DH}{BC} \Rightarrow \frac{\alpha + \frac{1}{2}}{\alpha + 1} = \frac{\frac{1}{2}}{\lambda} \Rightarrow \frac{2\alpha + 1}{2\alpha + 2} = \frac{1}{\lambda}$
 $\Rightarrow 14\alpha + 1\lambda = 11\alpha + 11 \Rightarrow 3\alpha = 10 \Rightarrow \alpha = 4,4$

6



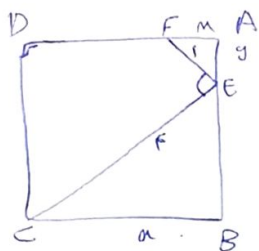
$h^2 = \alpha \times \mu = h = \sqrt{\alpha \mu}$
 $S_{\triangle ABD} = \frac{1}{2} \times \alpha \times \mu = \frac{1}{2} \times \sqrt{\alpha \mu} \times \sqrt{\alpha \mu} = \frac{1}{2} \times \alpha \mu$
 $S_{\triangle BCD} = \frac{1}{2} \times \mu \times \alpha = \frac{1}{2} \times \alpha \mu$
 $\frac{\sqrt{\alpha \mu}}{\sqrt{\alpha \mu}} = 1$

7



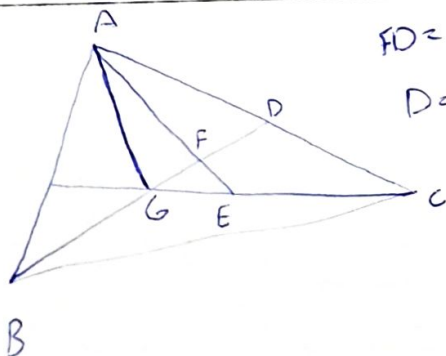
$\frac{S_{BMN}}{S_{ABC}} = \frac{BM \times BN}{BA \times BC} = \frac{BM}{AB} \times \frac{BN}{BC} = \frac{1}{\alpha} \Rightarrow \Delta$
 $\frac{BM}{AB} = \frac{1}{\alpha} \Rightarrow \frac{BM}{AM} = \frac{1}{\epsilon} = 1,25$

8



$FA = \alpha, AFE = BEC \quad \triangle AEF \sim \triangle BCE$
 $\frac{\alpha}{\alpha - y} = \frac{y}{\alpha} = \frac{1}{\alpha} \Rightarrow y = \frac{\alpha}{\epsilon} \Rightarrow \alpha = \frac{\alpha}{14} \Rightarrow \triangle BCE = \alpha^2 + \left(\frac{\alpha}{\epsilon}\right)^2 = \epsilon^2$
 $\Rightarrow \alpha^2 = \frac{(14)^2}{25} = 10,24$

9



$FD = \frac{1}{10} GD \xrightarrow{\text{مركز ثقل}} \triangle ACG$
 $D = \frac{1}{7} BD \xrightarrow{\text{مركز ثقل}} \triangle ABC$
 $\Rightarrow \frac{BD}{FD} = 9$

10