

$$\left(\frac{\sqrt{2}}{2} - \frac{\sqrt{3}}{2}\right)\left(\frac{\sqrt{2}}{2} + \frac{\sqrt{3}}{2}\right) = \frac{2}{4} - \frac{3}{4} = -\frac{1}{4} \quad (\text{الف})$$

$$\frac{1 + 3\left(\frac{1}{\sqrt{3}}\right)}{2\left(\frac{2}{\sqrt{3}}\right) + 2\left(\frac{2}{\sqrt{3}}\right)} = \frac{1 + \sqrt{3}}{3 + 1} \quad (\text{ب}) \quad 1$$

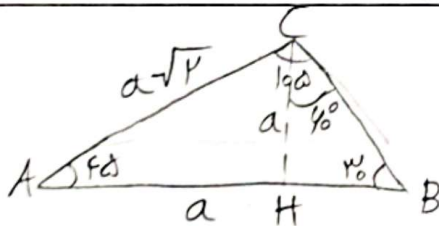
if $BH, AH = a \rightarrow a\sqrt{2} = \sqrt{2} \Rightarrow a = \sqrt{2}$
 $AC^2 = AH^2 + HC^2 \Rightarrow 12 = 2 + HC^2 \Rightarrow HC = \sqrt{10}$

$$\cot 30^\circ = \frac{CH}{AH} \Rightarrow \sqrt{3} = \frac{9}{AH} \Rightarrow AH = 3\sqrt{3}$$

$$\cos \hat{B} = \frac{AH}{AB} = \frac{3\sqrt{3}}{3\sqrt{4}} = \frac{\sqrt{3}}{2} \Rightarrow \hat{B} = 60^\circ$$

$$\left. \begin{aligned} \cot 30^\circ &= \frac{BC}{AB} \Rightarrow \sqrt{3} = \frac{BC}{10 - \sqrt{3}} \Rightarrow BC = 10\sqrt{3} \\ \cot 40^\circ &= \frac{BD}{AB} \Rightarrow \frac{1}{\sqrt{3}} = \frac{BD}{10\sqrt{3}} \Rightarrow BD = 10 \end{aligned} \right\} \Rightarrow x = 10\sqrt{3} - 10 = 10 \quad (\text{الف})$$

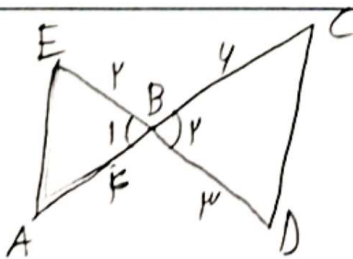
$$\left. \begin{aligned} \tan \hat{A} = \tan 60^\circ &= \frac{BC}{AB} \Rightarrow \sqrt{3} = \frac{BC}{2} \Rightarrow BC = 2\sqrt{3} \\ BC^2 + BD^2 &= CD^2 \Rightarrow CD^2 = 12 \Rightarrow CD = \sqrt{12} \end{aligned} \right\} \Rightarrow \sin \alpha = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3} \quad (\text{ب})$$



if $AH, CH = a \rightarrow AC = a\sqrt{2}$

$$\cot 30^\circ = \frac{BH}{CH} \Rightarrow \sqrt{3} = \frac{BH}{a} \Rightarrow BH = a\sqrt{3}$$

$$\frac{AB}{AC} = \frac{a\sqrt{3} + a}{a\sqrt{2}} = \frac{a(\sqrt{3} + 1)}{a\sqrt{2}} = \frac{\sqrt{3} + 1}{\sqrt{2}}$$



$$\hat{B}_1 = \hat{B}_2 \Rightarrow \sin \hat{B}_1 = \sin \hat{B}_2$$

$$\frac{S_{ABE}}{S_{BCD}} = \frac{\frac{1}{2} \times 1 \times 2 \times \sin \hat{B}_1}{\frac{1}{2} \times 1 \times 2 \times \sin \hat{B}_2} = \frac{4}{9}$$

$$S = ab \cdot \sin \alpha = 3 \times 4 \times \underbrace{\sin 110^\circ}_{\frac{\sqrt{3}}{2}} = 4\sqrt{3}$$

(الف)

$$S_{\text{ج}}' = 4 S_{\text{كوسين}} = 4 \left(\frac{1}{4} \times 3 \times \frac{3}{4} \times \frac{\sqrt{3}}{4} \right) = 3\sqrt{3}$$

(ب)

$$\tan \theta = \text{نسب خط} = \frac{F-1}{3-(-1)} = \frac{1}{4}$$

$$\frac{1}{\cos^2 \theta} = \tan^2 \theta + 1 \Rightarrow \cos^2 \theta = \frac{F}{a} \xrightarrow{\cos \theta > 0} \cos \theta = \frac{1}{\sqrt{a}} = \frac{1\sqrt{a}}{a}$$

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$$L_1: \text{خط} : y = x + 1/a \Rightarrow \tan \alpha = 1 \Rightarrow \alpha = 45^\circ \text{ ①}$$

$$\text{①} \rightarrow \theta = 110^\circ \Rightarrow \tan \theta = m = -\sqrt{3} \text{ و } b = 1/a = \frac{a}{1}$$

زاویه خط با محور

$$mb = -\frac{a\sqrt{3}}{1}$$

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$$f\left(\frac{a\pi}{4}\right) = \cos\left(\frac{11\pi}{4}\right) + \sin\left(-\frac{1\pi}{4}\right) - \tan\left(\frac{\pi}{4}\right) \Rightarrow$$

$$f\left(\frac{a\pi}{4}\right) = \frac{\sqrt{3}}{1} - \frac{\sqrt{3}}{1} - \sqrt{3} = -\sqrt{3}$$

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$$\frac{\sin\left(\frac{\pi}{4} + x\right) + \cos\left(\frac{3\pi}{4} - x\right)}{\cos(\pi + x) - \sin(-x)} = \frac{\cos x - \sin x}{-\cos x + \sin x} = -1$$

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