

$\left(\frac{\sqrt{2}}{2} - \frac{\sqrt{2}}{2}\right) \left(\frac{\sqrt{2}}{2} + \frac{\sqrt{2}}{2}\right) = \frac{2}{2} - \frac{2}{2} = -\frac{1}{2}$	$\frac{2}{2+1} = \frac{1}{2}$	۱
الف) $AH = \frac{F}{2} \times \sqrt{2} = \sqrt{2}$ $AC \times \sin C = AH \Rightarrow \sin C = \frac{AH}{AC} = \frac{1}{2}$ $\Rightarrow \cos C = \frac{\sqrt{3}}{2} \Rightarrow CH = AC \times \cos C$ $= \sqrt{2} \times \frac{\sqrt{3}}{2} = \sqrt{3}$	ب) $\cos C = \frac{\sqrt{3}}{2} \Rightarrow \frac{9}{AC} = \frac{\sqrt{3}}{2} \Rightarrow AC = 6\sqrt{3}$ $\sin C = \frac{AH}{\frac{9}{\sqrt{2}}} = \frac{1}{2} \Rightarrow AH = 3\sqrt{2}$ $\frac{3\sqrt{2}}{6\sqrt{3}} = \frac{1}{2} = \frac{\sqrt{2}}{2} \Rightarrow \hat{B} = 45^\circ$	۲
الف) $\tan \theta = \sqrt{2} = \frac{d \cdot \sqrt{2}}{BD} \Rightarrow BD = d$ $\tan \theta = \frac{\sqrt{2}}{2} = \frac{d \cdot \sqrt{2}}{d \cdot \theta} \Rightarrow d \cdot \sqrt{2} + \sqrt{2} \theta = d \cdot \sqrt{2}$ $\Rightarrow \theta = 100^\circ$	ب) $\cos \theta = \frac{1}{2} = \frac{5}{AC} \Rightarrow AC = 10$ $\sin \theta = \frac{\sqrt{3}}{2} = \frac{2\sqrt{2}}{BC} \Rightarrow BC = \frac{4\sqrt{2}}{\sqrt{3}}$ $\sqrt{(2\sqrt{2})^2 + 1^2} = \sqrt{CD} \Rightarrow \sqrt{CD} = \sqrt{5}$ $\Rightarrow \sin \alpha = \frac{\sqrt{5}}{10}$	۳
$\sin 10^\circ = \frac{1 + \cos 20^\circ}{2} \Rightarrow \sin 10^\circ = \frac{1 - \frac{\sqrt{3}}{2}}{2} = \frac{1 - \sqrt{3}}{4}$		
$\frac{c}{\sin A} = \frac{b}{\sin B} \Rightarrow \frac{c}{b} = \frac{\sin A}{\sin B} = \frac{1 - \frac{\sqrt{3}}{2}}{\frac{\sqrt{3}}{2}} = \frac{1 - \sqrt{3}}{\sqrt{3}}$ $\frac{AB}{AC} = \frac{a(\sqrt{3} + \sqrt{2})}{2a} = \frac{\sqrt{3} + \sqrt{2}}{2}$ $\tan \theta = \frac{2\sqrt{2}}{r} \rightarrow BH = \frac{2\sqrt{2}}{\frac{\sqrt{3}}{2}} = \frac{4\sqrt{2}}{\sqrt{3}} \rightarrow AB = BH + AH = \frac{4\sqrt{2}}{\sqrt{3}} + \frac{2\sqrt{2}}{2}$	$\hat{B}_1 = \hat{B}_2$ $\Rightarrow \sin A_1 = \sin A_2$	۴
$\frac{S_{BCD}}{S_{ABE}} = \frac{\frac{1}{2} \times \sqrt{2} \times \sqrt{2} \times \sin B_1}{\frac{1}{2} \times \sqrt{2} \times \sqrt{2} \times \sin B_2} = \frac{1}{1}$ $\Rightarrow \frac{S_{ABE}}{S_{BCD}} = \frac{1}{1}$		

$$\text{الف) } \frac{1}{2} \times c_x \times c_x \sin 120^\circ$$

$$= \frac{1}{2} \times c_x \times c_x \frac{\sqrt{3}}{2} = c_x \sqrt{3}$$

$$c_x \sqrt{3} \times c_x = 4\sqrt{3} \checkmark$$

$$\text{ب) } \frac{1}{2} \times c_x \times c_x \sin 120^\circ$$

$$= \frac{1}{2} \times c_x \times c_x \frac{\sqrt{3}}{2} = c_x \sqrt{3} \checkmark$$

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$$\text{میبند} = \frac{c-2}{c-(-1)} = \frac{1}{2} = \tan \theta \Rightarrow \frac{\sin \theta}{\cos \theta} = \frac{1}{2} \Rightarrow \sin \theta = \cos \theta \Rightarrow \sin \theta = \cos \theta$$

$$\sin^2 \theta + \cos^2 \theta = 1 \Rightarrow \sin^2 \theta + \sin^2 \theta = 1 \Rightarrow 2 \sin^2 \theta = 1 \Rightarrow \sin^2 \theta = \frac{1}{2} \Rightarrow \sin \theta = \frac{\sqrt{2}}{2}$$

$$\Rightarrow \cos \theta = \frac{\sqrt{2}}{2} \checkmark$$

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$$y = x + a \Rightarrow y = x + \frac{a}{\sin \theta} \Rightarrow \text{زاویه با محور ها} = \theta$$

$$\Rightarrow b = \frac{a}{\sin \theta}$$

$$\tan 120^\circ = -\sqrt{3}$$

$$y = -\sqrt{3}x + \frac{a}{2} \Rightarrow m \times b = \frac{-a\sqrt{3}}{2} \checkmark$$

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$$f(x) = \cos(\pi + x) + \sin\left(\frac{\pi}{2} - x\right) - \tan\left(\frac{\pi}{2} + x\right) \Rightarrow f(x) = -\cos x + \cos x$$

$$-(-\cot x) = \cot x \Rightarrow \cancel{f\left(\frac{4\pi}{9}\right)} = \cot\left(\frac{4\pi}{9}\right) = -\sqrt{3} \checkmark$$

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$$\frac{\sin\left(\frac{\pi}{2} + x\right) + \cos\left(\frac{\pi}{2} - x\right)}{\cos(\pi + x) - \sin(\pi - x)}$$

$$\frac{\cos x - \sin x}{-\cos x - (-\sin x)} = \frac{\cos x - \sin x}{-\cos x - \sin x} = -1 \checkmark$$

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